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SCIENCE & TECHNOLOGY

EUROPE & LATIN AMERICA

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EC CALLING FOR COHERENT SPACE POLICY

Luxembourg EUROPEAN PARLIAMENT SESSION DOCUMENTS in English Doc A 2-66/87, 25 May 87 pp 1-16

[Second EC report on European space policy, drawn up by Claus Toksvig on behalf of the Committee on Energy, Research, and Technology]

[Text]

At its meeting of 22 November 1984, the Committee on Energy, Research and Technology decided to draw up a report on the Community's space policy and appointed Mr TOKSVIG rapporteur.

At its sitting of 14 January 1985, the European Parliament authorized the Committee on Energy, Research and Technology to draw up this report. The Committee on Economic and Monetary Affairs and Industrial Policy and the Committee on Transport were asked for an opinion.

At its sitting of 7 October 1985, the European Parliament referred this report (Doc. A2-108/85) back to the Committee on Energy, Research and Technology.

Mr TOKSVIG was confirmed as rapporteur at the meeting of 27 June 1986.

The Committee considered the draft report at its meetings of 27/28 June 1986, 17/18 March 1987 and 29/30 April 1987, when it was adopted with 13 votes in favour and 3 against.

The following took part in the vote: Mr PONIATOWSKI (Chairman); Mr ADAM (Vice-Chairman): Mr KOLOKOTRONIS (Vice-Chairman): Mr CABEZON ALONSO, Mr CHIABRANDO, Mrs FAITH, Mr FORD (deputizing for Mr WEST), Mr HÄRLIN, Mr LINKOHR, Mr O'DONNELL (deputizing for Mr WEDEKIND), Mr SHERLOCK (deputizing for Mr TURNER), Mr SMITH, Mr SELIGMAN, Mr STAES, Mr TOKSVIG (deputizing for Mr ROBLES PIQUER) and Mrs VIEHOFF.

The opinion of the Committee on Transport will be published separately. The Committee on Economic and Monetary Affairs and Industrial Policy decided not to deliver an opinion.

The report was tabled on 8 May 1987.

The deadline for tabling amendments to this report will be indicated in the draft agenda for the part-session at which it will be debated.

The Committee on Energy, Research and Technology hereby submits to the European Parliament the following motion for a resolution together with explanatory statement.

A

MOTION FOR A RESOLUTION

on European space policy.

The European Parliament,

- having regard to the First report of the Committee on Energy, Research and Technology (Doc. A2-108/85),
- having regard to the Second report by the Committee on Energy, Research and Technology and the opinion of the Committee on Transport (Doc. A2-66/87).

A. Whereas the economic and social importance of space operations and the related goods and services is rapidly increasing in Europe;

B. Whereas the European Community itself increasingly finds itself involved in space-related activities;

1. Holds that the time has come for the European Community to work out a coherent policy on space activities:

2. Calls on the Commission to initiate the process by drafting a communication to the Council and European Parliament in which it should:

(a) set out a plan for co-ordinating the space activities in which the Community as such is already active, in such fields as telecommunications and remote-sensing;

(b) analyse the scope and potential of space-related industries in Europe and make preliminary proposals for their encouragement, notably in the context of Community research and development programmes such as ESPRIT, BRITE, RACE and others;

(c) suggest ways in which the Community could encourage training in the skills needed by space industries at all levels, e.g., by use of the Social Fund;

(d) improve European coordination of the use of satellite data:

(e) respond to the other recommendations set in the present Resolution:

(f) analyse the scope of the space programmes being carried out respectively by the European Space Agency (ESA) and each of its Member or associated States:

3. Supports the European Space Agency (ESA) in its efforts to achieve autonomous space capabilities on behalf of Europe, recognises it as the principal instrument of European cooperation in space matters and congratulates it on its record:

4. Warns that without autonomy in space operations Europe will be unable to derive full economic benefit from the scientific discoveries and technological innovations which it makes in this sector, and will fail to provide future generations of European scientists and engineers with outlets for creative achievement commensurate with their talents:

5. Identifies certain general principles which should guide the Community on its policy on space activities:

(a) they should be for peaceful purposes:

(b) they should be undertaken when there is a real expectation of benefit, in terms of an economic return or other increase in the well-being of populations, or in terms of an increase in scientific knowledge:

(c) they should, where practicable, be open to international cooperation;

6. Urges the establishment at European level of a postgraduate qualification in space science and engineering, which could be worked for at universities in different European countries, but which would be administered according to criteria laid down by a European validating authority created for this purpose:

7. Commends the role which the European Investment Bank has already played in financing satellites and encourages it to continue these efforts;

8. Stresses the special role which the European Community can play, bearing in mind its close links with a large number of developing countries, in promoting space-related activities for the benefit of these countries (e.g., in monitoring weather, crops and resources by earth-observation satellites, and in improving telecommunications and facilitating educational programmes involving direct broadcasting), acknowledges the work which is already being done on these lines and pledges its support for such work in the future:

9. Notes with interest proposals which have been made in various quarters for an international satellite monitoring agency which, with the objectives of protecting peace and of releasing resources at present devoted to the needs of defence for civilian applications, would help to monitor developments in areas where there is a risk of conflict:

10. Instructs its President to forward this resolution to the Council, the Commission, the Governments of the Member States, the Director General of the European Space Agency and the President of the European Investment Bank.

EXPLANATORY STATEMENT

1. Endorsement of the goal of European autonomy in space capabilities

The European Space Agency, which now has more than ten years' direct experience behind it, not counting that acquired by its precursor organisations, has concluded that Europe cannot rely solely on international co-operative projects as a means of taking part in space operations.

This does not mean that ESA has abandoned international co-operation - far from it. The co-ordination with the Soviet Union and Japan of last year's Giotto mission to Halley's Comet and ESA's planned co-operation in the orbital space-station project initiated by the United States show how committed the Agency remains to international collaboration.

However, experience has shown that co-operation does not automatically lead to a transfer of technology commensurate with the effort and expense involved in a given project. For example, when Europe developed Spacelab as an orbital laboratory to be taken into space on board the US Shuttle it did not thereby acquire any significant amount of shuttle technology. Spacelab was, in effect, treated as just another piece of cargo, and its sponsors as just another customer for a transport system. Just as the man who pays to have a container loaded onto a ship does not expect to have the right to find out how the ship works or is navigated, so ESA was not able to take on the role of a true partner in these operations.

There is another point. Although international projects are in theory a relatively economic way of getting into space, since the costs are spread among the partners, nevertheless in absolute terms these costs can be very large. (This point especially applies to the space-station project). The problem then arises that each partner finds a very large proportion of its limited budget tied up in the co-operative project, leaving its own autonomous operations starved of funds.

Obviously one big lump of expenditure is, in proportional terms, a worse problem for the partners who have small budgets than it is for those who have big ones. The advantages are stacked in favour of the big partner. Because he has put the most in he gets the most out. At the same time, by obliging the small partners to commit relatively large proportions of their resources to the project, he effectively reduces their capacity to acquire an autonomous capabibity. Clearly the danger arises that in circumstances such as these the small partners will in effect be subsidising the big partner to increase his technological lead over themselves.

Finally, international co-operation may lead to a loss in parliamentary or governmental control. International co-operative programmes are difficult to create, but they are even more difficult to dissolve. Europe should be cautious about its commitment to large international programmes such as the space-station.

2. Endorsement of the role of the European Space Agency

Parliament should endorse the role of the European Space Agency as the legitimate instrument for Europe's space activities. It would be inappropriate to propose building up the role of the European Community as such in space matters, via the Commission, at the expense of ESA, for at least three reasons:

(i) The resources available in Europe for space activities are relatively limited and need to be concentrated;

(ii) ESA has a proven record of achievement;

(iii) There is not enough money in the Community budget.

The fact that the membership of ESA includes countries which are not members of the EC is one of its strengths. Moreover, there is already practical co-operation between ESA and the Commission.

An important ESA Ministerial Conference is expected to take place in early summer 1987. The main point to be discussed will be ESA's long-term programme. Some of the elements of this are comparatively unproblematic, such as the science programme, and the applications programme. On the other hand,

there is likely to be a greater debate over matters connected with space infrastructure, e.g. Ariane, Hermès, Columbus and next-generation launchers, such as HOTOL or Sänger.

Although the European Parliament might or might not have reservations about the specific elements of the programme, there is a case for putting its political weight behind the general thrust of ESA's programme, and endorsing the necessary increase in its budget, as a way of helping Europe towards the goal of autonomy, which is fully consistent with the line which this Committee and Parliament has so resolutely taken on the need to promote Europe's competitiveness in research and innovation.

3. The need for greater co-ordination on space activities in which the European Community as such is involved

The European Community is becoming increasingly involved in space activities by an inevitable process as space technology takes on a more and more important role in such areas as remote sensing and telecommunications. There are now several Directorates-General of the Commission with a stake in space. The Commission has never, however, produced a co-ordinated plan for its space involvement, which is therefore, from the point of view of Parliamentary scrutiny, open to the criticism that it lacks transparency. At the time of the adoption of Parliament's last report on space policy in 1981 [2] Mr Davignon, Vice-President of the Commission said there was "real ambiguity" in the European Community's position on space policy, and gave an undertaking that without even waiting for the deadline set in the Turcat Resolution (i.e. autumn 1982) the Commission would take a public position on space policy, the development of its industrial strategy for research and innovation[3]. It is not perfectly clear that this undertaking was respected.

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[2] Turcat report (Doc: 1-326/81; OJ No. C260 of 12.10.1981, pp. 102-104 for Resolution of 18.9.1981)

[3] Verbatim report of proceedings of Monday 14.9.1981 - OJC 260

4. Involvment of space industries in EC R & D programmes and industrial policy

In recent years, when certain sectors of European industry suffered problems arising from economic recession, many industries connected with space activities showed a more promising performance. This reflected the fact that such space activities were moving from a pre-commercial phase into a commercial one. This fact has been highlighted recently by the consequences of the interruption of the US Shuttle programme and, to a less dramatic extent, by the interuption in the sequence of Ariane launches. The sudden unavailability of these major transport systems has drawn public attention to the size of the order-book for satellite launches and to the economic importance of the market which these represent.

As of February 1987 Spaceflight News reported that the number of satellites booked to fly aboard Ariane once the programme of launchers was resumed (possibly, from March 1987 onwards) had reached 41 involving contracts to an aggregate value of $ 1.98 billion. Of the 41 bookings, 24 were for European customers, 6 for customers in the U.S.A., 7 for INMARSAT and INTELSAT, one each for Australia and India, and 2 for Japan.

5 Space transport systems and in-orbit infrastructure

In a report which essentially concerns the basic principles of European Community space policy, it would be inappropriate to comment on each specific programme of ESA or individual European countries. However, one must refer to two issue areas and current topicality. First, there is the issue of new generations of space lanucher and related space transport systems (e.g. Hermès, Ariane V, HOTOL and Sänger). Second, there is the issue of in-orbit infrastructure and what this may involve (e.g. the Columbus project).

As regards the launcher issue, the Europeanisation of the Hermès project is something to welcome. Hermès will be a manned space vehicle with cargo-carrying capacity to be launched into space by a new generation of Ariane launcher which has yet to be developed. (Note that the most recent operational version of Ariane has been Ariane III. The first Ariane IV launch should take place in 1987). Meanwhile, however alternative concepts are being developed. The leading example at present is HOTOL, a project for

an entire new type of space vehicle being promoted by British Aerospace and Rolls-Royce. According to British Aerospace publicity, HOTOL, which could be piloted by remote control or a human crew, "is based on a remarkable new propulsion technique which allows the use of atmospheric oxygen to reduce on-board propellant mass and permits the use of wings to optimise the initial flight trajectory after take-off from a standard runway. This combination makes the long sought-after, single-stage-to-orbit launcher a practical proposition. The propulsive and aerodynamic characteristics result in a vehicle that is fully recoverable and totally and quickly reusable with minimum refurbishment, preparation and expense". In addition to HOTOL another concept has been advocated in Germany. Named Sänger after the late Professor Eugen Sänger, a German space pioneer, this is a plan for a two-stage space aeroplane which in 1986 was reported to have received DM 2.5 million from the German Government and MBB (Messerschmitt Boelkow Blohm).

One advantage of Hermès is that the French bodies behind it - CNES (Centre National d'Etudes Spatiales), Aérospatiale and Avions Marcel Dassault-Breguet aviation have conceived Hermès in such a way as to be fully complementary to the rest of the European space programme (Ariane, Columbus etc.). An advantage of projects such as HOTOL and Sänger is that, as well as their purely space role, they could also have a role as hypersonic airliners for earth transport (e.g., it has been claimed that HOTOL could fly from London to Sydney in forty-five minutes, part of the journey involving a ballistic trajectory outside the atmosphere).

On balance the view can be accepted that these various concepts are not necessarily in competition with each other, at least on the basis of technical criteria. Hermès can reasonably be assumed to be the next logical step, with HOTOL coming afterwards, if it lives up to the claims which have been made for it.

The shortage of money for space projects in Europe, however, means that technical criteria alone will not be decisive. There will inevitably be competition for scarce financial resources. At the same time, there are already indications that United States will be spending huge sums of money on a new generation of shuttle and/or a hypersonic airliner. In fact, while the UK is reported to have spent four million pounds on HOTOL development in 1986,

the US is said to have earmarked no less than four hundred million dollars for the development of an analogous project for Fiscal '87 (80% from the Department of Defense, 20% from NASA).

If the HOTOL project is as good as has been claimed, it is vital that Europe exploits it to the full. The same would be true for any other project that was judged to be better than HOTOL. This means that Europe must be prepared to find enough money quickly enough to safeguard its competitive position on this sector.

As regards in-orbit infrastructure, if ESA is unable to execute its Columbus project in co-operation with the US on the proposed space-station in a way which promotes the achievement of autonomous capabilities, preserves the potential independence of Columbus, secures access to vital space technologies and protects the civilian character of the programme, then the plan for co-operation with the US on the space-station should be dropped. Europe should in such circumstances give serious consideration to proceeding alone with Columbus, or in co-operation with partners such as Japan or Canada if the latter so wished.

6. <u>The role of the European Parliament in securing greater public accountability</u>

Space policy is undoubtedly a matter of great and legitimate public concern. The issues which it raises tend to come under four headings. First, there is the huge expense involved, and the associated problem of trying to make a sensible cost-benefit analysis. Then there is the strategic and military dimension. Third, there is everything which is implied by the fact that almost all space activity lies at the boundary of our knowledge, if not indeed beyond it. Fourthly, there is, for better or for worse, the vexed question of national prestige.

These matters are far too important to be exempt from democratic scrutiny and control, and they therefore represent a direct challenge to the European Parliament. Furthermore, it is important to recognise that decision making in space policy is dominated by producer group interests - i.e. the manufacturers

and ESA itself. With the increasing practical application of space technology, Parliament has a legitimate and important role in representing the "consumers" of space technology, i.e. the general public.

7. Criteria for space projects

Parliament should lay stress on the assessment of the utility and cost of European space activities and the need not merely to develop them for their own sake but to bring them to the point where there is a quantifiable justification in economic and social terms. This is the concept which the rapporteur has previously referred to as the "payback payload".

Parliament should also endorse the principle already adopted by ESA that space missions should involve human crews only where this is indispensible for practical reasons.

Parliament will also no doubt wish to oppose the idea of space projects being carried out for reasons of prestige alone.

8. Peaceful use of space

The terms on which both the European Community and the European Space Agency were formally constituted preclude the pursuit of military operations. Moreover the principle of the peaceful use of space in the interests of human well-being and the advance of scientific knowledge deserves to be defended.

9. The proposal for an international satellite monitoring agency

It would be consistent with the peaceful use of space to consider the establishment of an open system of reconnaissance by earth-observation satellites designed to give warning of military developments likely to result in conflict. This idea has already been discussed in certain international contexts. It was discussed at the second United Nations Space Conference in Vienna in August 1982. It was the subject of a recommendation by the Parliamentary Assembly of the Council of Europe (Recommended 957, detailed on 24 January 1983). This recommended that "the Committee of Ministers, on the occasion of their forthcoming exchange of views on United Nations matters with the participation of experts, review the state of action on the proposal for

the setting-up of an international satellite monitoring agency, and examine possibilities for renewed initiatives in this direction, either individually or collectively or in association with non-European industrialised or developing countries having a space capability".

10. The Role of space projects in development and co-operation

Encouragement should be given to the work which is already going on in the Commission and elsewhere to apply space technology in the service of developing countries, notably by satellite remote-sensing. Thought should also be given to ways in which the European Community can help developing countries implement educational programmes based on direct broadcasting by satellite.

11. Training and qualifications for space scientists, engineers and technicians

The European Parliament has strongly backed efforts to obtain mutual recognition of qualifications in the Community. Since space is a comparatively new field, the possibility should be examined of instituting a European postgraduate qualification in space science and engineering which would be valid throughout Europe. A small academy or institute would be created, not to teach or to carry out research, but simply to establish and monitor the academic standards of the qualifications, which would be offered after a period of study at suitable universities or other institutes in the Member States.

As regards the training of technicians and skilled workers for space-related industries, the Commission should recognise that this a sector of special interest in view of the promising position of these industries in Europe. There is already a shortage of the right kind of personnel. The Commission should be encouraged in all her efforts to solve this problem and to prepare the way for the future needs of this expanding sector by use of the Social Fund or any other appreciated means.

12. Role of the European Investment Bank

The European Investment Bank has a role to play in financing space projects. Indeed, the fact that it has already begun to play such a role is an indication of the growing commercial importance of space operations. For example, on 20 June 1986 the European Investment Bank announced that it was lending 75 MECU to EUTELSAT for the construction and placing into orbit of the Organisation's second generation of satellites. (EUTELSAT, the European Telecommunications Satellite Organisation, has 26 European Member Countries, including the 12 EC Member States). The European Investment Bank deserves encouragement in its lending activities in space-related sectors.

13. Recommendations for future action by the European Community

What is needed now is for the Community to take stock of its existing activities in the space sector, and of the implications of developments in that sector for existing areas of Community policy, with due regard to special responsibilities and prerogatives of the European Space Agency and of the authorities in the Member States.

If the Commission were to draft a communication dealing with issues raised in the present report and making a clear statement of its own approach to this important policy area, this would be a necessary and constructive first step.

CSO: 3698/A020

MBB OF FRG STUDIES NEW AERODYNAMIC TECHNOLOGY

36980020a Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 28 Sep 87 p 8

[Text] Turbulence-free airflow on the external skin of an aircraft--the boundary layer--reduces resistance, saves fuel and improves economy on in-service flight.
As is often the case in technology in general, solutions to problems in aerodynamics also seem to be based on somthing simple. A hitherto little regarded phenomenon in nature helped aerodynamicists in their research in the field of boundary layer stabilization. It is a very thin plastic film, which has an infinitely large number of sharp ribs running parallel to each other, stamped into the material on one side with great precision--similar to the grooves on a phonograph record. Surface grooves like this have have been used for many years, primarily in advertising, to create special optical effects. They refract light and cause an object behind the film, a picture, for example, to appear to change depending on the angle of the light falling on it. This happens mostly when the film-image is moved. The ribs, which resemble a prism in cross section, perform an optical function in this instance. It has already been demonstrated in tests that they can have the desired mechanical effect on the airflow around an airplane.

Investigations are currently in progress at the MBB company transportation and passenger aircraft group research laboratories, in cooperation with Airbus Industrie and the other Airbus partners, whether the "riblets" (the English technical term for the lines of ribs) have the desired, effective turbulence-reducing effect and are applicable in aircraft construction. Because of the riblets' microstructure--for the MBB tests they are being given a height and width of 0.05 mm--it will not be possible to make any conclusive statement about an effective application until practical flight tests using this riblet system have been completed.

The MBB transportation and passenger aircraft group is presently studying the riblet films for their aerodynamic effect and the possibility of using them in actual operating conditions. MBB is working in this area with the German Research and Development Institute for Air and Space Travel (DFVLR), with universities and a German chemical company. Successful application of the riblets is crucially dependent on how precisely they can be manufactured, and here the emphasis is on the requirement for sharp edges to the shape of the profile

peak. Only sharp peaks guarantee the high degree of effectiveness of the film, which is based in part on the fact that subduing of turbulence takes place immediately on the surface of the outer skin and results in a reduction of resistance. Wind tunnel measurements at the DFVLR and at MBB have shown that--depending on the quality of the film, among other factors--frictional resistance can be reduced by up to 8 percent.

Aerodynamic influences resulting from the riblet film are dependent on local airflow conditions on the external skin of the aircraft. How the riblet film works is influenced to some extent by the angle at which the airflow strikes the riblets, and in part by the pressure on the external skin of the aircraft, which changes with the airflow.

The work being conducted on this technology is also helping to improve a purely physical understanding of this novel application in aircraft construction. In order to achieve worthwhile results in the final analysis, large sections of the aircraft, practically the entire fuselage, parts of the wings and the control surfaces will have to covered with riblet film. The MBB transportation and passenger aircraft group has been concentrating its efforts in this group project basically on the work relating to the application of the novel material. The riblet films have to be attached to the external skin of an aircraft so that the lines of the ribs are parallel to the line of flight.

One of the benefits of the riblets is their light weight. The weight of the film to cover an Airbus A320 does not exceed 150 kg. Against this--since the 0.07-mm thick film can easily be color impregnated--it would be possible to dispense with painting the aircraft. The paint for the A320 weighs more than twice the weight of the film. With the reduction of resistance from boundary layer turbulence as a consequence of using the riblets directly on the aircraft's outer skin, the reduction in wind resistance, relative to the entire aircraft, has been calculated to be about 2 percent. Translated into terms of fuel consumption, for instance, for the Airbus A320 in regular line service, this amounts to a savings of more than 50,000 liters of fuel for each aircraft annually.

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CSO: 36980020a

OVERVIEW OF SPAIN'S SPACE EFFORT

36980083 Madrid REVISTA DE AERONAUTICA Y ASTRONAUTICA in Spanish Oct 87 pp 1041-1044

[Interview with CDTI director Jaime Sodupe Roure by Manuel Corral Baciero: "Spain: A New National Space Program"; date and place not given]

[Text] Grandiose words always have the drawback of appearing to cloak events with special relevance and profound implications for all aspects of our lives.

This fact makes it difficult to use them when we have to deal with matters of lesser--at least directly so--social relevance, as is the case with the matter that concerns us here: our nation's effort in the domain of space.

Nevertheless, we must indeed resort to one of these "grandiose words": revolution, to describe what has recently been happening in this field in Spain.

And with this we are referring to what the transfer of the responsibilities and special activities of CONIE [not further identified], a Ministry of Defense agency, to the Center for the Development of Industrial Technology (CDTI), a Ministry of Industry and Energy agency, following promulgation of the 14 April 1986 Law for the Promotion and General Coordination of Scientific and Technical Research (Science Law) has meant to us.

Some of the functions of the CDTI are, among others, to promote collaboration between industry and technological research and development institutions and agencies, to collaborate with the Interministerial Science and Technology Commission to obtain satisfactory scientific, technological and industrial returns from international programs which Spain participates in and to administer those it may be entrusted with.

It has one foot in industry, another in public and private research centers, another in all those departments of the administration involved in the technical, scientific or economic aspects of the sector and another in the many organizations and international consortiums in which Spain--even though it may be with a small voice--has something to say and do.

It is at present the coordinating and planning agency for our space policy, which is reflected in the National Space Program. This is why REVISTA DE

AERONAUTICA Y ASTRONAUTICA has considered it necessary to report on it in its pages, making use on the occasion of this report of statements on the future of Spanish space activities through the words of CDTI director Don Jaime Sodupe Roure.

[Question] What are the basic characteristics of the new National Space Program?

[Answer] From the point of view of the Space Coordinating Commission, created in January 1987, the program must respond to a basic principle of supporting our participation as a member state of the European Space Agency (ESA). In the frequent dialectic in the European countries regarding the different national space programs--especially in cases like France and Italy and their participation in the agency--we possess an importance and measure of participation in the face of the challenge imposed on us by the ESA program for the year 2000 that make it fundamental for our national program to serve to lend support, with an appreciable increase in our financial contribution, to what must be our participation in a manner worthy of us in the agency over the next 12 years.

Our objective is to see to it that within this period our participation in ESA is gradually at a level that is in keeping with our gross national product: from 6 to 6.5 percent (ESA anticipates a budget of 4.5 billion pesetas for the Long-Term Space Program), with several quality and technology contracts for our industry and a scientific yield for our universities and scientific organizations of intangible value, but of great interest inasmuch as it presupposes the incorporation of, for example, national planning experiments already in progress. We believe that this involvement in space fields is one of the decisive programs for our industry and scientific groups' acquiring knowledge so that they will in future be competitive in high-tech fields that have applications in many other fields: biomedicine, compound materials, electronics, telecommunications..., given the fact that the ESA Long-Term Program has all these components.

This proposal does not exclude the fact that, of our industy is strengthened in the future, we intend to reach bilateral agreements with other countries and space agencies and foreign industrialists so that we may be conspicuous in other subsectors of space activities.

Our program is shaping up as a multidisciplinary one, involving very different sectors that overlap with other national research programs, but it is important to maintain unity of action in our space operations.

[Question] Is participation in ESA going to be proportionately the same in all of its programs?

[Answer] Spain's cumulative participation in space programs over the past 20 years has been on the order of 3 percent, a modest participation in ESA. As the programs and their financial component are multiplying, our danger lies not only in not growing, but in the fact that we may be left behind in sectors like equipment assembly, never reaching the level of systems and breakthroughs of what the space race in Europe is going to be in the next few years.

This is a political decision that cannot be avoided because we are about to get on the bandwagon or lose out and, realizing that there are other priorities, that public funds are scarce, we have to determine what it can be assumed will not participate in some future technologies.

As for the homogeneity of our participation in the different programs, some commitments have already been obtained: participation in ESA general expenses or in the scientific program instituted by the agency to the extent of 10 percent. This mandatory program has a big industrial component for the construction of satellites.

Spain participates in it from research centers as well as from industry, improving our competence in manufacturing and in science.

The percentage of our share in the Long-Term Program is going to be maintained, while the rest of the agency's scheduled programs are gaining ever greater importance due to Ariane, which entailed a change in the agency's operating rules because of the big share of its financing and production that France retained for itself. Later Columbus, DRS [not further identified] for telecommunications, verification and follow-up and lastly Hermes appeared on the scene. In short, ever more complex programs already involved in putting man into space, along with an increase in investments at an exponential rate.

In these optional programs we have pledged ourselves for about 3 percent in Ariane-5, 8 percent in Columbus and 7 percent in Hermes for the preliminary phases.

We will maintain these percentages when and if we obtain returns in both quantity and quality. With this in mind, we have gone from a return of 80 percent to 94 percent with the objective of attaining 100 percent. To achieve this, we must generate an industrial capacity, grouping our industrial sectors and obtaining greater responsibilities in specific sectors.

[Question] To what extent are our industries and research centers facing up to these challenges?

[Answer] While there are sectors that have been traditionally associated with European programs to a fairly large extent, as is, for example, CASA [not further identified] with compound materials or precision machinery, our industrial sector is very small; there are many unexploited sectors and in others we are very far behind Europe, as may be the case with electronics in general, which is occupying an ever more powerful position in the final importance of space equipment. It may, however, be added that, while in earth-based electronics our position is a strong one, this is not the case in space electronics, which is much more complex and which is why we must quickly make an effort to beef up this sector.

We have a structural shortage of diversified companies with sufficient work and critical mass. Some of them are highly specialized, others very big, but they engage in few or no space-related activities. We must make a very determined effort to incorporate them because they lack human resources, installations, laboratories....

But there are fields that will be important in the future in which we may occupy a position with very solid prospects, as may be the case with biomedicine within 10 years time. In this field we plan to install part of the Hermes Astronaut Training Center in Barcelona, a city that is going to have a great deal of experience in medicine for athletes and sportsmen and one that is located very close to the French training center in Toulouse.

[Question] With regard to this proposal, what level of collaboration is going to be maintained with other agencies and foreign firms?

[Answer] Bilateral agreements are very important and will supplement the space program.

We are linked with NASA through earth-based tracking stations, a field in which we have attained a high degree of professionalism and competence, being the most experienced European country, but we think that our relations with NASA must be expanded, which is why we plan to identify those areas in which we might establish reasonable relations within moderation. However, this is not the right moment, as we can also see through ESA, due to the crisis in NASA and the difficulty in finding go-betweens.

With regard to other relations, we are looking for differentiating factors in terms of which we may be competitive in reaching agreements on specific matters. The Italian model is a good example to follow with this proposal.

We would like to reach agreements with the USSR, which has accumulated the most experience in life-support systems in space, if the Spanish biomedicine in space sector develops as we think it will, similar in form to the agreements ESA and France already have [with the USSR] and we believe it advisable for us to arrive at means of cooperation in horizontal technological programs with the remaining countries and industrial and scientific sectors to make productive use of our efforts in common.

[Question] Is the maintenance of any sort of independent operation anticipated?

[Answer] To our way of thinking, no, because more and more we think that what goes on in such superspecialized sectors, involving the highest of technologies, must be linked with international activities, and I believe that the defense of our national interests, which after all is of concern to all of us, can be better conducted from collaborative positions, when and if we can find a suitable niche in the market, and we know how to specialize in Europe in something we do best in a way that is of interest to the other countries, rather than planning to do a little of everything as has been the case up to now, engaging in some activities that we have maintained over a period of time without specific motivation for working on space research for the future.

For example, Europe has already established a camp at Kiruna in Sweden for the launching of tracking missiles, completely equipped. To plan to salvage Arenosillo for the same purpose at this time would not enter into a European policy, aside from what it would cost, which does not exclude the possibility of our seeking out other activities, in view of the impossibility of maintaining it exclusively for the launching of tracking missiles.

[Question] What is the significance of the transfer of responsibilities in matters concerning space that has taken place since the promulgation of the Science Law?

[Answer] This is a decision of our government, made on the basis of the fact that Spain was the only ESA member country that was represented through the Ministry of Defense and, while its activities have a lot to do with defense, the fact is that ESA is funded and develops its operations for explicitly peaceful uses, producing problems like those there are at the present time in defining European collaboration on the U.S.-International Space Station, in view of its possible military use and the posture of neutral ESA members like Switzerland, Austria or Sweden.

The transfer is taking place by means of an approval system and by trying to see to it that our participation is justified by satisfactory returns. With this in mind, CDTI is a state company, which Eureka, Airbus or ECNR is listed as, companies which in all these cases of international industrial cooperation are trying to achieve the same objectives.

I must say that up to now the assessment of this change that can be made is positive because in the field of information we are earnestly, rigorously and promptly providing a constant service for our business firms so that they may knowledgeably participate in contracts, bids and specifications. A great effort is being made with the support of data-processing systems to try to satisfactorily disseminate the huge volume of information that is in circulation.

11466

FOKKER RECEIVES FUNDS FROM NETHERLANDS GOVERNMENT, BANKS

36980020b Duesseldorf HANDELSBLATT in German 27 Oct 87 p 19

[Text] Brussels, 26 Oct--The Dutch state will grant the Amsterdam aircraft constructor Fokker N.V. additional credits of 212 million Dutch guilders. The banking houses of ABN, Amro and NMB will grant additional loans in the amount of 225 million Dutch guilders.

The new monies are part of a package of measures that is intended to eliminate the company's acute liquidity crisis. The Ministries of Economic Affairs and Finance had been working on the package for about 2 weeks with the banks and Fokker. The public credit granted is to appear in the annual statement of accounts as credit under guaranteed assets, made up of the company's net worth and long-term outside capital. The same thing will happen with a past loan of 433 million Dutch guilders, which was paid off by a national investment company.

In the event of future increases in the company's own capital, the state retains a maximum share of 49 percent for itself. Long-term loans, which are not transferred to the company's net worth capital, are to be turned into convertible, deferred loans. For 1986 Fokker's balance sheet shows a total of 1.486 billion Dutch guilders. The company's own captial was 281 million Dutch guilders, long-term outside investment was shown as 687 million Dutch guilders.

Fokker was not prepared to make any more precise statements about a possible boost in the company's own capital, but it did hint that something of this nature could be expected in the near future. In view of the company's precarious situation, the terms of existing back credits guaranteed by the state will be extended. In a public statement, Minister of Economic Affairs De Korte makes it abundantly clear that, following the approval of the new public credit, his budgetary funds to extend further assistance to Fokker were exhausted. According to the ministry, the 212 million guilders are intended for running development costs of the new F-50 and F-100 models.

The fresh funds are tied to clear conditions imposed on Fokker's management. The company is to make vigorous efforts to continue cooperative work with third parties. A few weeks ago the aircraft constructor signed an appropriate agreement of intent with the German company MBB. The position of director of finance, which has been vacant for some time, is to be filled as soon as possible. The board of directors is also to be strengthened in numbers over the short term.

Until this happens, the two present members of the board of directors will be assisted by an advisory staff, consisting of an expert in each of the fields of trade, technology and financial questions. At the same time Fokker bound itself in the agreement to undertake a drastic cost reduction program. In recent weeks criticism had been levelled from various sides not only at the board, but at middle management as well. As the Ministry for Economic Affairs in The Hague says, the two new aircraft and the package of measures that has now been presented will form the basis for the company's continuing development. The package was presented yesterday by the Ministry for Economic Affairs to the parliamentary economic commission for discussion.

9581
CSO: 36980020b

BRIEFS

ESA DATA COMMUNICATION NETWORK--An analysis of requirements for exchange, access to and storage of data from past and future space missions performed on behalf on ESA has shown the need of a digital communications network, this solution being preferred to a single archive centre for data because of the greater flexibility and utility to the scientists involved. It is expected that implementation will take place over five years with management and coordination becoming the responsibility of ESA's research centre at Frascati (ESRIN). The network will make use of existing facilities at the ESA Operations Centre (ESOC) at Darmstadt. [Text] [Luxembourg IES NEWS in English Jun 87 p 2]

CSO: 3698/A305-E

BIOTECHNOLOGICAL R&D AT EUROPEAN MOLECULAR LABORATORY

36980033 Milan BIOTEC in Italian Feb 87 pp 21-29

[Article by Maria Rosa Cattadori: "At Heidelberg a European Laboratory"]

[Excerpts] In the South of the Federal Republic of Germany, the European Molecular Biology Laboratory [EMBL] attests to the scientific commitment of 14 nations.

Organization

Legally, the EMBL and its two outlying stations enjoy the privileges and operate under the laws relative to international institutions. The EMBL's two executive authorities are its Board of Directors and its managing director.

The Board consists of two delegates from each member country. The primary purpose of the Board is to decide the EMBL's policy from the scientific, technical, financial and administrative viewpoints. The Board also appoints a Scientific Advisory Committee and a Finance Committee.

The first of these consists of 15 scientists, from all over the world, and collaborates with the managing director in the implementation of the Scientific Program. The second consists of representatives of the member countries.

The managing director is the EMBL's legal representative and its highest authority. Elected by the Board for a specified period, he oversees the drawing up of the Scientific Program, assisted by a scientific, technical and administrative staff elected by the Board. In his other functions, the managing director is assisted by the Standing Advisory Committee, the representatives of which are elected by all members of the personnel.

Scientific Impact

"From the scientific standpoint, our contribution is expressed in three ways," explains Professor Lennart Philipson, the EMBL's managing director since 1982. "First, we try to be an institute that is more flexible than national institutes, trying out new ways to bring people together to study

problems, and facilitating an intellectual exchange. We seek to be, at one and the same time, an experiment and a model for the member countries on how to make successful use of their intellectual and financial resources. But to become a frame of reference, we must first acquire scientific credibility. Secondly, we are trying to develop new techniques and instrumentation to help overcome the difficulties encountered in research methods. Every time this has been accomplished there has been an accompanying leap in theoretical understanding of the problem. DNA technology is essentially a method. Thus, with the creation of new vectors and new molecules for the DNA technology, we have extended the development of instrumentation from a purely physical field to the biochemical, to the biological fields. Furthermore, our programmers and computers are enabling information derived from the sequencing of DNA and proteins, from analysis of their structure and from genetic mapping, to be gathered and made available to all countries via a hardware and software network which we coordinate, in collaboration also with the United States and Japan."

Training and Educational Activity

And lastly, our third and perhaps most meaningful contribution is the one we are making to the education and training of scientists. We are doing this in two ways. From a strictly didactic standpoint, by organizing practical and theoretical courses, workshops and symposiums annually, granting scholarships at various levels, and offering a 3-to-4-year doctoral study program which accepts 6 to 8 graduate students yearly, whom we finance through our scholarships. At the post-doctorate level, on the other hand, our contribution finds expression both in the presence of 75-80 students who undergo a period of specialization with us, but who must be independent of any financial aid from us, and at our group-leader level. At this level, equivalent to that of associate professor, young researchers are accepted who have already had 2 years of scientifically independent post-doctorate experience, and who are capable of organizing and leading a small group (5 to 10 persons, including an engineer, a graduate student, and one or more post-doctorate members), of managing a budget, and of procuring funding. In this case as well, our aim is to train, over a period ranging from 3 to a maximum of 9 years, young scientists or tomorrow's professors, who can return to their countries with a cultural baggage that will enable their advantageous placement." To ensure maximum mobility and flexibility within the laboratory, an effort is made to avoid lasting ties. This does not preclude the possibility, however, of converting a temporary contract such as that of group leader to a more stable one of senior scientist. Five-year contracts are considered automatically renewed unless revoked. In this case, the senior scientist can look forward to another 5-year contract, during which to find other employment. There is still another level, which is that of program coordinator: A senior scientist who, within each program, coordinates the activities of the group leaders in such a way as to maximize and optimize cooperation and create the critical mass necessary for the development of each program.

There are 550 persons working at the EMBL, 230 of whom form part of the scientific staff. The total annual budget, which is contributed to by all the member countries, is approximately DM45 million. Each country's contribution is proportional to its gross national product. Italy contributes approximately 13 percent of the EMBL's total budget, Germany 23 percent, Israel 0.8 percent. In exchange, each nation is "entitled" to a share in terms of presence at the Laboratory. "During the past 2 years," says Prof Riccardo Cortese, coordinator of the Genetic Regulation and Structure Program, "the presence of Italian researchers within the Laboratory has grown to the point where in 1986 it totaled 36 persons, and around 12 percent, thus attaining 'parity' between economic contribution and representation. Presently working at the EMBL are 4 full professors as group leaders, 1 associate professor, university or CNR researchers, and doctoral candidates, who have maintained their contacts with the Italian scientific community, stimulating scientific interchanges at the level of young recruits." But 50 percent of the Italians at the EMBL are unemployed graduates in Italy. This is the negative side that emerges sadly from these figures. While on the one hand the total number of researchers working at the EMBL for more or less long periods has grown (visiting workers are also numerous), the percentage of Italian members of the EMBO [European Molecular Biology Organization], on the other hand, has shrunk from 10 percent in 1970 to 5 percent today (the num of Italian members in 1986 was 30). For the first time, there is no new Italian candidate for the 1987 elections, versus tens of British, French and German candidates. "The Italians receive few votes, because their scientific contribution is considered insufficient," adds Prof Cortese. In the approximately 10 years since its founding, the EMBO has attained three of its original goals, through the operative presence of the EMBL, whose importance is thus beyond question and its role necessary to maintain and expand current activities in the development of molecular biology. The EMBL accomplishes this end as follows:

New Way of Approaching Research

"First of all," continues the managing director, "the old approach to research, which separated biology into distinct topics (immunology, zoology, botany, etc) is no longer meaningful. A project or a problem must first be defined, and to it must be brought persons with diverse backgrounds, ranging from physics to chemistry to microscopy, in a kind of 'joint project,' for a more complete approach. Thus, we have defined seven Research Programs, under each of which various topics of particular interest have been defined involving the assignment of 8 or 9 independent groups coordinated by a program coordinator."

Five of these programs cover topics of "basic" research. They are: Cellular Biology, Differentiation, Biological Structures, Genetic Regulation and Structure, and Biocomputing. The other two--Physical Instrumentation and Biochemical Instrumentationin addition to their scientific aspect, cover also specific services.

The Cellular Biology Program studies the cellular distribution system that starts at the endoplasmic reticulum and distributes the newly synthesized proteins inside the cell: How they are selected, classified and distributed to the nuclear membrane, to the Golgi complex, to the lysosomes, mitochondria and chloroplasts, and to the cell surface, and how they are secreted. Considerable care is required in the development of samples in vitro, and in the use of recombinant DNA techniques to study membrane traffic at the molecular level.

Two other groups address the cytoskeleton: The role of the microtubules and centrosomes in cell transport and in the forming of the mitotic spindle. These groups work closely with the Physical Instrumentations Program, under which the necessary equipment setups are developed.

For the separation of subcellular fractions, a new method has been developed in collaboration with the Biochemical Instrumentations and Molecular Biology groups, based on the use of antibodies specific to single organisms, and of magnetic spheres. "For this purpose, use is made of monodisperse spheres containing magnetic particles treated with antibodies against antigens present on the surface of the organisms to be separated. The sample is incubated in the presence of the immunospheres, then washed with a specific buffer in the presence of a magnetic field. The nonmagnetic and nonbound particles are washed away. In this case as well, a computer-controlled automatic device was designed which is expected to be used in the future for the separation of chromosomes and for the purification of proteins." Under this Program, the pluridiscipline-based approach is giving good results, and the nine groups comprising it are working together very efficiently, notwithstanding their diverse backgrounds, and are earning the necessary international reputation.

The same "topic-oriented" model has been applied to the Differentiation Program, in which the researchers of nine groups are working on the function of oncogenes in growth control, on differentiation, and on development in various cellular systems.

Two groups are working on the activation of nuclear oncogenes by factors present in serum, and on their regulation. Other projects cover the use of retroviruses both as vectors and as oncogenic sequences capable of transforming hematopoietic cells in line, and the study of the role of their regulative sequences. Work is also being done on the study of the function of protooncogenes of the *ras* family in yeast, and on the function of *c-src* regulation in eukaryotic cells. Dr Wagner is studying regulation in embryonic cellular lines, in hematopoietic cell precursors, and in mouse embryos in their initial developmental stages. "It is believed," he explained, "that some processes, such as precisely the differentiation of germinal cells and embryonal development, are controlled by a differential genic expression. Little is known about the genic expression control mechanism during differentiation, and we have therefore decided to study the role of single genes in diverse systems, both in vivo and in vitro. Lacking specific mutants, we introduce the single genes into the germinal cells and in the mouse, using diverse methods. In this way we can analyze the elements that control the

cell-specific and temporal expression of genes, and study the effects of genic expression on the organism. The most commonly used method at present for gene transfer in mice is injection of DNA into the pronucleus of the fertilized egg," he continued. An alternative method is the use of retroviruses, which permit insertion either directly into embryos or into embryonic cells of carcinoma, or in germinal embryonic cells that can be used for the forming of chimeric mice. "Retroviral vectors offer innumerable advantages, including their ability to infect diverse cells, with practically 100 percent efficiency and high expressivity (10 to 50 times higher with respect to that of genes introduced by transfection, for example), and generally integrating a single copy of the provirus, which expresses stably the exogenous gene. Their disadvantages include instability of the provirus, and size of the incorporated DNA, approximately 8 kb, which is a limiting factor particularly for the expression of genomic DNA's. We, however, are using these vectors to study genic expression, and its inhibition in transgenic mice and in undifferentiated embryonic lines."

Under the Biological Structures Program, which includes seven groups, studies are under way, using electron microscopy and X-ray crystallography techniques, on membrane proteins, DNA-binding proteins, the DNAsi I-DNA complex, the Rop (repressor of primer) protein, the protein-RNA interaction in *Xenopus laevis*, the structure of some eukaryote genes, and processing of the RNA's of chloroplasts.

The Genic Regulation and Structure Program, headed by Professor Cortese, comprises five groups, approximately 50 researchers and technicians involved in genetic engineering projects, and includes a large Italian participation. This Program is the one having the most ties with the biotechnologies, and covers, in close collaboration with the Biological Structures Program, specific tissue expression and some of the control mechanisms involved in transcription. It also has another objective: As experts in molecular genetics, to develop new methods of inquiry that can yield more accurate and detailed research data to the other groups as well, such as those in the Structures and Differentiation Programs.

Interesting because of their applicative aspect are studies being conducted by Dr Stunnemberg on vaccine viruses. "These viruses are now very popular because they can be used as 'live' vaccines, a characteristic that renders them very attractive to the biotechnologies industry. Information for extraneous proteins can be injected into the genome of the virus to obtain proteins or antigens against AIDS or hepatitis, for example. Owing to their strong promoter, these viruses can be used industrially to produce large quantities of proteins. This, however, is not our purpose. To date, this system is still poorly characterized; therefore, we are endeavoring to study and characterize the virus's promoters and control elements. Only by knowing fully the basic mechanisms involved can production yields be maximized. Often, industries don't want to lose time in basic research, but this can sometimes compromise future developments."

The Biocomputing Program is also a relatively recent one and it, too, has a dual function. Professor Sander, recently arrived at the EMBL from the Max Planck Institute, outlined the organization of this Program. "From the scientific viewpoint, there are two groups working on proteinic folding: One from the standpoint of developing mathematical models for reconstruction of the image and determination of the structure; and the other via a search for homologous sequences and the study of their significance in determining tridimensional structure." Three other groups are engaged in support and development activities. For example, they are responsible for the EMBL's Data Library, Computer Graphics Structures, and Planning Management and Development. All of these operations require considerable competence in the dynamics of proteins, protein design, artificial intelligence, and molecular graphics."

The "service" offered by this group enables the gathering into the data bank of all the DNA sequences published. "The pressures are strong for the sequencing of the entire human genome, and our data bank today is only one one-thousandth the size that would be necessary if the project were to be implemented," says Professor Philipson. The latter two Programs are an example of how the "service" and "scientific" aspects can coexist.

Biochemical Instrumentations is pursuing three principal lines of research. One group studies the chemistry of proteins and also provides a service with the synthesizing of peptides and the analysis of aminoacids. The second group is working on the chemistry of nucleic acids, the synthesis of oligonucleotides, and the development of new nonradioactive, but fluorescent, molecules for in situ hybridization and for sequencing of DNA, or in the future for direct application to cells.

"The third group, which is mine and is called Microanalytical Techniques, is developing an automatic means for sequencing DNA, an automated and computerized method of microinjection, a means for separation of cells or organisms, and a number of necessary techniques for building out beyond basic research," explains Dr Ansorge, a physicist who has personally conceived and developed some of the principal means referred to. "Two methods are being used for the transfer of macromolecules within the cells: One consists of introducing all the macromolecules possible (proteins, antibodies, DNA, RNA) by means of tiny capillaries with tips only a few microns in diameter." Microinjection has always been a highly complicated technique and one that is hard to acquire. This method simplifies it and puts it within reach of all. "This system facilitates the preparation of some 2,000 cells per hour; our future sights are set on raising this to 10,000 cells per hour. Zeiss has provided substantial support in the testing of this system and will handle its commercialization (not before a year from now)." In collaboration with Professor Cortese, this technique, which to date has been used for monomolecular-film-cultured cells, will be applied to *Xenopus* eggs. Its principal advantage is that molecules can be microinjected at precise points and the cells tracked accurately by means of the fluorescent compound and the computer, even after a few days.

"The second method," Ansorge continues, "known as electrophoration or electrotransfection, is suited to mass production: Some 10 million cells can be processed in a few seconds. Both techniques are particularly suited to the case in which the calcium phosphate technique, which nevertheless remains a very valid one, cannot be successfully applied. The electrophoration process is very simple: The cells are resuspended in a transfection buffer, the DNA is added and incubated for 10-15 minutes, then a certain number of pulses, between 3 and 5, is applied to the suspension at given intervals of time. This probably alters the structure of the cytoplasm. Strange as it may seem, the cells appear less damaged than when processed with calcium phosphate, and the rate of survival after processing is approximately 90 percent." The DNA automatic sequencing system appears very promising, in view also of the more immediate requirements of the biologists involved in major sequencing projects. "Our system permits the sequencing of 300-350 bases in 4-5 hours, but it is not yet optimized. These times can be reduced by half in the future. Another and no less important phase that is being conducted jointly with the biologists is the automating of preparation of the samples to be sequenced, so as to permit maximum reproducibility of the results obtained. Sequencing with the fluorescent marker is 10 times more economical than the radioactive method. The sensitivity of the fluorescent method is very good (10^{-18} mole per band) but the samples must necessarily be very clean." Concluding his remarks, Ansorge says, "To date, the EMBL has patented 5 systems, which are being marketed by the larger specialized companies, such as Zeiss, which distributes the system I have developed for microinjection, or LKB, which distributes the sequencing system. These industries contribute generally as well, by financing our research at the prototype level, and this represents a major contribution for the Laboratory. Industry also pays a royalty and the cost of patenting, and receives a license to distribute the product."

Initially, the biggest investments went into the Physical Instrumentations Program. The currently most outstanding development has been in the field of cryomicroscopy, with the development of an electron microscope that enables the observation of samples at such low temperatures that they are not damaged by the formation of ice crystals during freezing. "The sample can thus be analyzed without the need for fixings, colorations or inclusions. The freezing temperature, close to absolute zero, is attained in a fraction of a second, thus obtaining an amorphous or 'vitrified-water' phase, with the transparency of glass, permitting direct observation of the samples in a native state," explained Dr McDowall, who works with Professor Dubochet under the Biological Structures Program, and who uses these techniques for the study of the chromatin.

There are also two Outstations: One at Grenoble and one at Hamburg. At Hamburg there is a very powerful synchrotron for the study of structures, which enables the obtaining of results in 1 and 1/2 hours, versus 24 hours with traditional equipment. At Grenoble, there is ongoing collaboration among France, Germany, Great Britain, and now Spain as well, on the study of biological structures by means of neutron beams, which have less resolving power than X-rays, but which permit studying relationships between DNA and proteins, or lipids and proteins.

Curious as to how a balance is struck between the groups dedicated solely to research and those that also offer services, this became my last question to Professor Philipson. His reply: "In this case, in addition to its normal budget for research, we provide the group with all the means necessary to cover the service aspect. For example, the group that assists us in preparing oligonucleotides receives the additional aid of an engineer and two technicians who are assigned to work on the service being provided. The group leader need only supervise. He thus has the benefit of a larger group and can, for example, utilize 10-20 percent of the time of these persons for his own research. Furthermore, he can stay with the Laboratory for a longer period than the other group leaders."

[End of main body of article; boxed material on p 25 follows]:

History

The history of the EMBL cannot be disassociated from that of two other institutions: the EMBO (European Molecular Biology Organization) and the EMBC (European Molecular Biology Conference). Initially, the EMBO was made up of 12 member countries from Western Europe, plus Israel, totaling 140 persons. (Its present membership totals 550 persons.) In 1964, it was registered in Geneva as an independent nonprofit organization, under Swiss law. At that point, the EMBO acquired a legal identity, a Board of Directors which today has 15 elected members, the backing of the Swiss Government, which became the advocate vis-a-vis the other countries with respect to the creation of the new European Molecular Biology Laboratory, and a donation, from Israel as well as the Volkswagen Foundation, that enabled the financing of its first scholarships and its first courses and workshops. From this initial experiment, it immediately became clear that financial help would be needed from all the European countries, and not just in the form of donations, substantial though they might be. Thus, in February 1969, after repeated meetings, the Governments of the European Governments announced officially their financial backing of the EMBO's scientific initiatives, for an initial period of 5 years, through the European Molecular Biology Conference, or EMBC. France, Federal Republic of Germany, the Netherlands, Norway, Sweden, Switzerland and Great Britain signed the agreement. They were joined shortly thereafter, by Austria, Denmark, Greece, Italy and Spain, and by Israel, Ireland, Finland, Iceland and Belgium. Nothing was said officially concerning the biology laboratory. This notwithstanding, in November 1970, four working groups were formed for the purpose of studying the role of the new laboratory, its position with respect to the national institutions, and its organizational and administrative aspects. Finally, in 1972, the laboratory project was unveiled and submitted to the member countries of the EMBC. Ten of these countries (Austria, France, Denmark, the Netherlands, Israel, Italy, Switzerland, Sweden, Great Britain and Federal Republic of Germany) joined the project and gave it the green light. Since then, Norway, Greece and Spain have also joined. On 10 May 1973, the "Laboratory Agreement" was signed, and in May 1978 the European Laboratory was officially inaugurated. Its first managing director, Sir John Kendrew, ended his mandate in 1982 and was succeeded by the present managing director, from the University of Uppsala. The Secretariat of the EMBC and the EMBO have transferred their offices from Brussels to the new Laboratory, where they meet annually. This is also the seat of the EMBO JOURNAL.

9399

EEC EXPANDING BIOTECHNOLOGY ACTION PROGRAM

Brussels EEC INFORMATION MEMO in English No P(87) 72, Oct 87 pp 1-2

[Article: "Biotechnology: European Commission Proposes a Revision of Current Programme To Increase Training and Risk-Assessment R&D"]

[Text] The Commission is proposing a revision of the Biotechnology Action Programme (1985-1989) with a request for supplementary funding of 20 million ecu. The content of this revision is as follows:

1) An increase in training in all pasts of the current programme.

There is a real shortage of research scientists with specialist qualifications of use to the biotechnology industry in Europe. An additional 4 million ecu would allow a sharp increase to be made in the number of short and long-term training contracts adapted to the very heavy demands for highly specialised researchers.

2) The integration of Spanish and Portugese laboratories.

The enlargement of the Community to include Spain and Portugal took place after the start of the current Biotechnology Action Programme. An additional sum of 4 million ecu would allow the negotiation of 30-40 new contracts which would allow a substantial involvement of both countries in all sectors (research and training) of the programme.

3) Extension of the bioinformatics part of the programme.

Bioinformatics is the use of information technologies for biotechnology applications: data banks for genetic information, (genome sequences), computer-aided design for protein modelling, and data processing related to biological culture collection, etc. This is essential for the emergence of a supportive infrastructure for biotechnology research in Europe and a further 4.3 million ecu will allow the impact of bioinformatics to reach significance.

4) Increase in the research related to risk-assessment.

This is particularly concerned with the assessment of risks associated with the deliberate release of genetically engineered microorganisms for agricultural uses. An additional 4.4 million ecu is requested to strengthen

this work, because it is through common research on the pathogenicity, toxicity and possible ecologically disruptive effects of new genetic diversity that a scientific basis will be created for the establishment of efficient regulation.

5) Feasibility studies for the next biotechnology R&D programme (1990-1994).

The Commission is asking for 2 million ecu to assess the technical requirements for Community research on genome mapping and sequencing in biological species useful to man. (This is the systematic reading of the genetic information stored in DNA etc).

The Commission is also asking for 1.3 million ecu for additional staff and operational costs in implementing the new initiatives (including the dissemination of results to industry).

The aim of the research action programme in biotechnology is to improve the capacity of the Member States to compete with the outside world in areas relevant to the preparation of improved agricultural and bio-industrial products. The programme includes enzyme engineering, genetic engineering, in vitro testing of molecules for toxicity, cell technology and collections of biotic materials.

The programme is also intended to contribute to the establishment of new methods for the evaluation of biohazards and to the uniform and harmonious development of policies and regulations governing the promotion of modern biotechnology in the Community. These aims cannot be fully achieved without stepping up the current effort in fields essential to the development of biotechnology, and without the participation of Spain and Portugal in the programme's activities.

Community research programmes in biotechnology have already generated some spectacular results: Among the achievements was the transfer of genetic information into onion, daffodil and asparagus. This was a world first, because these plants were hitherto unamenable to transformation by genetic engineering. It was an important first step towards the transfer of new genetic material into cereals, and thereby improve their economic yield.

In the same field, 16 laboratories throughout the Community combined their efforts to isolate and characterise more than 20 different genes at the molecular level. (Only 86 had been described at the end of 1984.) These govern important properties such as the nutritional characteristics of grains, resistance to insects, interaction with symbiotic micro-organisms etc, and will provide the basic material to be used for plant improvement using recombinant DNA technologies.

CSO: 3698A062

ITALIAN ADVANCES IN BIOTECHNOLOGICAL DIAGNOSTICS

36980033 Milan INDUSTRIA OGGI in Italian Apr 87 pp 78-82

[Interview with officials of Sorin Biomedica, of the Fiat Group: "Industrial Outlook for Diagnostic Kits," by Aldo Lupini]

[Text] Medicine is today the field in which the biotechnologies find their major application.

Recent advances in the biotechnologies have made possible the production of culture-medium-grown cells that can express antibodies. This important scientific discovery has had a significant impact on the production of diagnostic kits and on the feasibility of in vivo diagnosing of tumors.

Five years ago, the CNR [National Research Council] instituted a Targeted Projects Program aimed specifically at developing the technologies necessary to transform reagents, used only in specially equipped laboratories, into quality pharmaceuticals on an industrial scale.

The economic fallouts of this program are highly promising: Approximately half the outlay for acquisition of hepatitis diagnostic kits used in transfusion centers is now being satisfied by Italian production, resulting in a saving of around 30 billion lire annually on imports. This scenario could prove valid for the tumoral and AIDS diagnostic markets as well, the ultimate sizes of which are as yet difficult to foresee. Also attracting considerable interest is the potential for developing tumoral therapeutic applications based on these pioneering studies in scintillography. From an industrial standpoint, the use of monoclonal antibodies enables significant economies of scale. In the case of antiserums produced by the injection of cells into animals the ratio between quantity of product obtained and production cost remains constant; in the case of monoclonal antibodies, on the other hand, because the cells that produce them are grown in culture mediums, the larger the volume the lower the production cost per unit product.

As to the potential for diagnostic and therapeutic uses of monoclonal antibodies specific to tumors, we have interviewed Antonio Siccardi, professor of biology, of the College of Medicine at the University of Milan, and director of the CNR's Cellular Immunology Subproject under its Biomedical and Healthcare Technologies targeted project.

[Question] What is the underlying idea of the subproject that you head?

[Answer] The idea behind the Targeted Projects Program is to facilitate the integrating of research with the transfer of technology from the public sector to private industry.

In 1983, the targeted project in which I am involved inatituted a multicentric study to evaluate the real clinical applicability and diagnostic effectiveness of associating scintillographic techniques with marked-monoclonal-antibodies techniques.

The study involved, in addition to the institution at which I work, also that of Clinical Physiology at Pisa, the Department of Microbiology and Immunology of the New York Medical College, Institutes for Tumoral Therapy at Milan and Rome, and Sorin Biomedica of the Fiat Group, as well as some 10 other associated entities specializing, for the most part, in nuclear medicine. This broad gamut of contributions would not have been possible without the means of implementation provided by the CNR Targeted Projects Program.

[Question] What is the purpose of the project and what difficulties have you had to overcome?

[Answer] I have headed at a managerial level the Immunocellular Subproject of the targeted project headed by Prof Luigi Donato, director of the CNR Institute of Clinical Physiology at Pisa.

The most original idea of this subproject is, without doubt, that of developing a method for in vivo diagnosing of tumors. The purpose is to put these techniques to practical use by developing an industrializable type of diagnostic test capable of revealing directly, inside the patient, a preferential localization of the radioactive compound delivered by the monoclonal antibody at the site of the tumor.

Until now, the technique currently used in diagnostic kits has been to extract the patient's serum and test it for the presence of dissolved antigens, using monoclonal antibodies marked with radioactive substances.

In the in vivo diagnostic technique, on the other hand, the marked antibody is injected into a patient afflicted with the tumor to be imaged. Owing to the existing affinity between the antibody and the antigen present on the tumoral cells, the antibody will localize at the site of the tumor. The distribution of radioactivity among the various organs is then scanned using an immunoscintillographic technique, revealing which of the organs is producing the most intense emission, and thus enabling a pinpointing of the tumor. To attain this result, we have had to overcome various problems which can be summarized as follows: In the first place, the obtaining of a monoclonal antibody that exhibits good specificity against the tumor we are seeking (and whose existence is revealed in vitro by tumoral cells). Secondly, guarding against undesired secondary reactions in the patient, hence making sure that the monoclonal antibodies will not tend to bind to the cells of healthy organs.

And finally, a determination must be made as to the best radioisotope to use (the indispensable properties being ease of transported and detectability by means of immunoscintillography). This brings us to the starting point of clinical testing.

It is at this level that the advantages of being able to conduct a multicentric study become preponderant. And it is at this level that our laboratory has been able to coordinate the world's most significant multicentric studies, involving the testing of over 1,000 patients for antimelanoma as well as anti-CEA.

Clinical Advantages

[Question] Does this technology also offer a therapeutical potential for tumors?

[Answer] Typically, this technique is used in the post-operative period, to detect possible incompletely excised portions of tumor, the development of metastasis, or in any case to detect any residual tumoral growth.

The major interest of these researches is unquestionably linked to possible use of monoclonal antibodies as vectors for therapeutic agents. Probably the first generation of these agents will consist of radioactive therapeutic agents; that is, substances whose own radioactivity is used to kill the tumor. In this case, alpha emissions are used, which are of a higher energy level than the gamma radiations normally used in diagnostics.

In the future, an attempt will be made to conjugate toxins with monoclonal antibodies. This potential is extremely attractive, but is still at a much less advanced experimental research level.

The major problems connected with these techniques derive from the fact that, with the attachment of even a single radioactive isotope, the monoclonal antibody changes its distribution, becoming less specific. Thus, if we conjugate with it an entire protein, such as a toxin, which is hundreds of times more cumbersome than an isotope, problems of altered distribution are certain to be encountered. This could result in accumulations of a damaging nature in healthy organs.

The objective for the future is clearly to find a molecular form of antibody that will retain its interactive characteristics even when functioning as a vector for other molecules.

The formidable difficulties that must be overcome in using radioactive therapeutic substances are owing also to the fact that, to eliminate the tumor, approximately 2,000 rads must be delivered to it. Delivery of this amount of radioactivity to the tumor requires subjecting the patient's body to a great deal of aspecific radioactivity, involving the risk of killing the patient with the therapy that is intended to cure him.

Toxins present the same problems, in that, while it is true that radioactivity kills the cells, it is also true that toxins are much more effective in this respect: One is sufficient to destroy a cell. The use of toxins, therefore, requires an extremely high degree of selectivity, approximately 100 times higher for the tumor with respect to other organs.

Techniques of the diagnostic type are the pioneering base for developing the techniques of the therapeutic type, if only because toxic substances cannot be administered unless one is absolutely certain that they will be delivered only to the tumor.

To diagnose a tumor with marked monoclonal antibodies, it is sufficient to track them to a site where they exhibit a preferential localization in terms of a dispersion approximately only twice the level of that measured in healthy tissues; while with therapy using radioactive substances, the required order of magnitude is approximately ten times.

[Question] How have relations progressed with industry under the Targeted Projects Program?

[Answer] Under the Targeted Projects Program, as it was understood by Professor Donato, the industries were not consulted a posteriori on scientific programs that had already been more or less decided; but they were consulted from the start of implementation of the targeted project concerned. At Sorin, I headed three operations units concerned with various aspects of the production, biochemistry and radiochemistry of monoclonals. Sorin was, in fact, an integral part of the project.

[Question] Why was Sorin specifically chosen as the project's industrial counterpart?

[Answer] In the past, I had contributed to the setting up of a laboratory at Sorin Biomedica for the preparation of monoclonal antibodies. In time, it became Italy's largest industrial laboratory for the study and preparation of monoclonal antibodies, where research is carried on from its initial stage to the development of the marketable reagent.

Sorin has thus acquired a vast experience in recent years in the production of monoclonal antibodies. In particular, it has already produced a number of monoclonal antibodies of diagnostic interest both for hepatitis and for other antigens. It therefore seemed to us to be the ideal partner for collaboration in a study as demanding as this.

Role of Sorin

We concluded our interview with Siccardi, but continued the discourse relative to the role of industry, interviewing Gian Alfredo Scassellati, assistant manager of Sorin Biomedica, as to how the firm had managed to institute such a fruitful relationship with public sector agencies: "Sorin Biomedica," he said, "has been collaborating actively with the CNR now since the 1960's, when Sorin began working on reagents for diagnostic use.

"When the Targeted Projects Program was created, Sorin, based on its competence in radiochemistry and the chemistry of proteins, participated in the Cellular Immunology Project. I would say that the Targeted Projects Program represents a forward leap in quality compared to the prior earmarked-appropriations approach, in that the Program provides a useful instrument for the transfer of know-how among the participants in research.

"As a result of the research it has done on monoclonal antibodies, Sorin has become a confirmed leader in this sector. By applying the monoclonal technology, we have modernized the diagnostic kits we were already producing, thus, on the one hand, consolidating our market position in this sector, and, on the other hand, reducing our production costs."

Thus, in this case, sound management of the Targeted Projects Program has brought forth an efficient collaboration between private industry and an agency of the public sector, facilitating the technology transfer that is one of the most important mechanisms through which it is possible to proceed from basic research to the commercialization of highly innovative and industrially viable products.

9399

ITALIAN UNIVERSITY-INDUSTRY RELATIONS IN BIOTECHNOLOGY EXAMINED

Milan CHIMICA OGGI in English Apr 87 pp 69-70

[Excerpt]

University-Industry Research Relationships in Biotechnology (UIRRB)

UIRRB in Italy

Italy is surely not on the charts as a big-time player in the field of commercial biotechnology. Nevertheless, I will briefly illustrate what is going on with Italian biotechnology, with University-mical company, operates in variety of fields touched by biotecnology (e.g., pharmaceuticals, vaccines, agriculture, fine and commodity chemicals, etc.) and has taken pretty much the same approach to UIRRB. [As published]

The Swiss pharmaceutical company *Roche* has approached the issue of UIRRB in Italy by establishing in 1984 the Milano Molecular Pharmacology Lab (MPL), which represents a unique example of symbiosis between University and Industry. Indeed, contrary to others who have established an industrial laboratory within or on the outskirts of a university, MPL is an academic research lab operating in an industrial setting. The staff is currently composed of university personnel and is involved in the field of Molecular Neurobiology. From the company's point of view, this entails the following advantages: an excellent introduction into the Italian scientific and medical community, a source of trained personnel without obbligatory hiring, and the possibility of attracting public research funding. Roche has endowed $ 2 million for the setting-up of MPL, it provides it with $ 200,000 a year for direct costs and with all the necessary support and services. Freedom of research and publication is guaranteed and an international Scientific Advisory Board, composed of Roche top research managers worldwide and Italian University professors, is in charge of overseeing MPL's current and future activities.

The type of research being carried out is of a very basic nature and no problem of confidentiality and/or patentability has yet come up. Also in this case, the Dean of The University of Milan had the authority to stipulate the agreement with Roche, without involving the Roman bureaucracy. I am told that, although MPL is still at an infant stage, all the parties involved seem to be quite satisfied with the experiment: the company, the University, the personnel and even the Trade Unions. MPL appears to have stimulated a lot of interest in the pharmaceutical firms operating in Italy, both national and multinational; a few companies are studying this model of UIRRB and are considering following it.

Many other established Italian companies have a good record of productive UIRRB. I may cite: *Sorin Biomedica* of the Fiat group, *Sigma-Tau*, *Serono*, *FIDIA*.

As a last example, I wish to briefly describe a unique case of entrepreneurial ingenuity. Far from being a new Genentech, it examplifies what can be

done in Italy and it allows me to pitch for my home team!

In 1984, an Italian entrepreneur agreed with the Office for Technology Transfer of the National Council of Research to form a company to commercially develop the research of two Italian Universities. Because of lack of capital venture in the country, the company (Technogenetics Inc.) was incorporated in the U.S. with 100% control of the Italian affiliate, and made a public offering, arranged by the Broadchild Securities Corp., in July 1984 to raise $ 2.5 million on the American OTC stock market. The money was to be used in the funding of R & D at university and to build in-house production facilities. The company has had revenues for $ 250,000 in its first year of operation and $ 3.5 million in 1986, the year in which Recordati SpA aquired 58.3% control of it through the issue of new shares for a total of $ 5,866,000. The funds will be used for further expansion into the Italian, European and American diagnostic markets.

To conclude, I should say that, while discussing University-Industry relationships with my Italian colleagues, I have often heard two kinds of criticism. On the one hand, industry is considered as a parasite of university, which grabs public funds to buy reagents and technologies at low prices, but gives little in return to academia in term of real collaboration on long term projects. On the other hand, University is viewed as inconclusive, disorganized and enclosed upon itself with no appreciation of the potential of biotechnology as applied for the general good.

The truth is that, largely thanks to the commercial opportunities offered by modern biotechnology, much has changed in Italy, as in other countries, in terms of University-Industry relationships. Academia has learned from Industry about the practical relevance of some of its research and Industry is learning to consider University not just as a small bunch of well paid "opinion leaders" with access to the Ministries. A law of 1980 has established a far greater autonomy for universities than they had in the past and the criteria to stipulate research contracts can be established by each individual university. Opportunities for cross fertilization and commercial developments are abbundant. I myself, for example, have a position of adjunct professor of biotechnology at the University of Milan and a few students are doing their experimental thesis in our laboratories. My lab at Recordati has been designated as an "Operational Unit" of the National Council of Research and we have collaboration on different projects with half a dozen academic institutions.

As a concluding prediction, when the National Programs for biotechnology will be operational, I bet that the initiative that the Italians will demonstrate in UIRRB's will be even greater than their known creativity in design and high fashion!.

8600
CSO: 3698/M050

BRIEFS

GENETICALLY ENGINEERED POLYMERS--The CERMAV (Vegetable Macromolecule Research Center) at Saint-Martin d'Heres near Grenoble is currently studying some ten polysaccharide-producing strains with new properties. The Center is using genetic modifications to optimize the properties of one family of polysaccharides produced by soil bacteria (rhizobium). One of these strains produces a polysaccharide with a hitherto unknown structure and which is now being explained. Other strains synthetize polymers the viscosity of which when in solution far exceeds that of polymers currently available (for example, relative viscosities for polymers concentrations of 0.5 g/l in an 0.1 sodium chloride solution of between 1,000 and 2,000 have been found as against 40 for the most viscous microbial polysaccharides currently available on the market). For technical reasons, scientists at the CERMAV have generally restricted themselves to studying only exocellular polysaccharides. In a certain number of bacteria, a polymer with an intracellular reserve is also produced, this refers to PHB or polyhydroxybutyrate (and its copolymers) produced on a pilot scale by the firm ICI. The possible application of these polymers in agri-food cosmetic or even pharmaceutical sectors is currently the subject of industrial investigation. [Text] [Paris FTS--FRENCH TECHNOLOGY SURVEY in English Jun 87 p 7]

CSO: 3698/A301-E

BRIEFS

STANDARDIZATION IN ROBOTICS--DIN, the German standardization institute, has been allocated Fr 4 billion, two-thirds of which was funded by industry and one-third by the government. The money is intended to finance technical studies of robots over the next 7 years, and will further reinforce the FRG's lead in standardization. "In this field, France is 5 to 6 years behind its German neighbor," confesses the Ministry of Industry. [Text] [Paris L'USINE NOUVELLE in French 5 Nov 87 p 58] 25063

FRG LASER FACTORY--Stuttgart. Trumpf GmbH [Limited Liability Company] & Co. Machine Factory in Ditzingen has just placed in operation its new "laser factory" which is among the biggest of its kind in Europe. In this way, this internationally leading manufacturer of metalworking machinery and systems now has the capacity needed for this new business sector which is gaining importance. More than 10 years ago, Trumpf started the first cutting experiments using laser beams; today, company boss Berthold Leibinger estimates that the outfit "is the most important manufacturer of laser systems for manufacturing technology in Europe." In addition to the use of laser technology in metalworking, Trumpf sees employment possibilities in car body welding technology and medical technology. Besides, the laser unit is also being sold to third parties. This is why a demonstration center was connected to the new laser factory. As we reported earlier (HB [HANDELSBLATT], 11 November), Trumpf was able during the 1986-1987 fiscal year (as of 30 June) to increase its business volume involving laser machines (combined laser punching machines and laser-only machines) by 107 percent to a total of DM90 million; today, about 20 percent of the laser business consist of shipments of laser subsystems for installation in the systems of other manufacturers (OEM sales). The business volume of the Trumpf Group rose 14 percent to a total of DM458 million worldwide. [Text] [Duesseldorf HANDELSBLATT in German 17 Nov 87 p 12] 5058

5058
CSO: 3698/0064

EUROPEAN ES2 FACTORY INAUGURATED

Amsterdam COMPUTABLE in Dutch 16 Oct 87 p 11

[Article by Robbert Hoeffnagel: "European ES2 Plant Inaugurated--Agreement with Japanese Mitsui"; first paragraph is COMPUTABLE introduction]

[Text] Aix-en-Provence--Last week French Minister of Economic Affairs Madelin officially inaugurated the European plant of European Silicon Structures (ES2). According to ES2 spokesmen, the plant is entirely geared towards short-term production of application specific integrated circuits (ASIC's). This has been made possible by, among other things, a production process replacing the expensive and time-consuming use of masks with a process of direct "writing" on the wafer.

The European ES2 plant is located in Rousset in the south of France. Apparently, the choice of this location is not based only on the high level of French subsidies. "It is not easy to convince a large number of highly qualified technicians to leave the leading companies in this industry. In this respect the south of France has a lot to offer with its climate and life style," says Rod Attwooll, ES2 vice president and director of operations.

The French plant is fully equipped for the production of small batches of ASIC's. The cycle time between design and finished product must be reduced to a minimum with this kind of circuit, according to Robin Saxby, director of northern Europe. "That is done in two ways. First, in the design phase we use simulations and other techniques to try to minimize the error rate and to increase the number of "first-time-right" products. Second, we have improved production technology. We have replaced the use of masks to create the various circuit layers in the wafer by a method of direct writing on the wafer using an electron beam." For this purpose ES2 has acquired a Perkin Elmer Aeble-150 direct write E-beam machine.

The French plant is ES2's second production facility. Since mid-1986 the company has been renting capacity on an existing production line of Exel in San Jose, CA. This capacity will be maintained. Says Christopher Gare, manager of corporate marketing: "The Exel production facility is currently used by US2, the U.S. division of ES2. Besides, the production line in California can be considered as a back-up for the French plant."

US2 is a 100-percent ES2 subsidiary and its activities are as yet exclusively

directed towards California. In addition, a cooperation agreement was concluded with the Japanese Mitsui concern a couple of weeks ago. Says Attwooll: "ES2 is a European concern, though it should not make the mistake of focusing solely on Europe. The Japanese market is gigantic and we expect to do good business there via Mitsui."

Cooperation with Mitsui is not only based on technological arguments. "Mitsui is not only a high-tech company, it also offers the advantage of having many business contacts through a range of cooperation agreements." Although the idea appeals to him, Attwooll does not wish to respond to the question of whether this cooperation--which is in fact a distribution agreement for ES2's design software--will lead to the creation of what is already being called JS2.

Division

In Attwooll's opinion, ES2's future lies especially in the upper-level ASIC market. "We divide the market into two parts: the relatively simple products of up to, say, 2,000 gates per chip, and the more complex circuits. We do not target the bottom-of-the-line market, that is more for local businesses such as the ASIC company in the Netherlands."

Attwooll also divides the upper level of the market into two consumer groups: "the so-called first-time users and companies such as Philips or British Aerospace, which already are experienced users but want to have better products supplied in shorter terms." ES2's products and services are focused on these two user groups: The company offers a training program for companies wanting to investigate the possibilities of ASIC's as well as software products for circuit design for both first-time users and experienced designers (the Solo 1000, 1200, and 2000 software).

Thus, together with the production facilities, the company has three sources of income. This is not yet enough to break even, but that is as yet not necessary, says A. Kloezen, Euroventures BV general director and member of the ES2 Council of Commissioners. "Investments in such companies are not expected to produce short-term profits. Investing here means making a strategic choice. Eventually, profitability is of course desirable. For the moment ES2 is slightly behind schedule, but it does not have to be profitable before the end of 1989, and as things are right now, this will be achieved."

25048
CSO: 3698A043

LETI OF FRANCE DEVELOPS NEW MASK PRODUCTION FACILITIES

36980078 Paris ELECTRONIQUE ACTUALITES in French 6 Nov 87 p 20

[Article by S. Dumontet]

[Text] The AEC's LETI [Electronics and Data Processing Technology Laboratory, Grenoble] Division, whose mask production service was opened to the outside world 3 or 4 years ago, has just installed a complete production line for the manufacture of masks for integrated optics. A very narrow, specific field in which LETI is aiming for a worldwide clientele. What LETI is offering is its know-how in the production of extremely precise masks capable of admitting oblique lines in all directions, circles, rings, etc. The object being to produce a mask from a design within the space of 10 days and at a price the laboratory feels is attractive, that is, one that comes to about 10,000 francs per level (there is generally only one level for this type of application, they stated), depending on how difficult it is to produce the mask.

Standard Critical Dimensions of 0.5 µm

In addition to masks for integrated optics, LETI is offering to produce masks for other applications (microelectronics, surface-wave filters, microelectronic and optical sensors and resolution test patterns, etc.), stating that the company is only aiming to fill the slot of special masks that are in demand and hard to produce. And this, on the one hand, on a worldwide scale because the clientele it is aiming for is not very large in France (LETI thinks that the ESPRIT involving integrated optics should produce a certain demand) and, on the other, because LETI is offering to perform special functions the supply of which is probably very limited throughout the world.

The means available to LETI are a mask station that employs eight people, two of whom are specialized in data processing. The system used to generate patterns is a Philips EBPG 3 electronic network model, the size of whose spot may vary from between 1 and 0.025 microns. The LETI spokesmen stated that the company has developed its own methods with commercial resins for electronic networks, PBS resins and negative CMS resins. The chromium of the masks is engraved by means of a Nextral dry engraving system. For the inspection of the masks, the laboratory is especially equipped with a Cambridge Leitz-system electron microscope for the measurement of critical dimensions and "overlay" measurements and with a KLA [not further identified] Klaris system for chip by chip inspection or by the chip on the basis of the data base. At the very head

of the assembly line the laboratory has a Calma software program for the designing of masks, into which special tracing functions have been developed. With this assembly line, the laboratory intends to achieve "standard" critical dimensions of 0.5 microns and it was indicated that this could be reduced to 0.3 microns. Among the jobs it can perform, LETI cited wave guides with a marginal capacity of a "standard" 0.2 microns over the entire length and LETI indicated that [a capacity of] 0.1 microns could be obtained by operating with a very fine grid. LETI also mentioned resolution test patterns for deep UV light reflectors. Mask engraving time averages less than an hours.

11466

BRIEFS

MULTILAYER ORGANIC FILMS--By placing molecules composed of a hydrophile head and a long hydrophobic chain on water and by then compressing them one against the other, a sort of two-dimensional solid is produced. This (single) layer can then be transferred to a substrate. The multi-layered films obtained by repeating this process have certain interesting properties for industry, notably in the field of non-linear optics and can also serve as models for biological membranes. Researchers of the CEA (Atomic Energy Commission) and the Central Research Laboratory of Thomson-CSF have studied multi-layer Langmuir-Blodgett films by combining two complementary analysis techniques: electronic microscopics and the reflective measurement of X-rays. Their work devoted to the study of the morphology and surface texture of these films has demonstrated that over a space of several micrometers, a film of 26 layers of organic fatty acid molecules has various types of structural defects hitherto unknown. When applied to a film floating on water, these techniques provide useful information concerning the first stages in the formation of these films. They open new horizons for the study of capillary waves. Eventually, they should lead to improvements in the techniques used to produce Langmuir-Blodgett Films. They have already been applied in polishing surface-sweep incidence X-ray diffraction techniques for studying surfaces. [Text] [Paris FTS--FRENCH TECHNOLOGY SURVEY in English Jun 87 p 4]

INTERNATIONAL CHIP STANDARD--Frankfurt--In order to do justice to the developments in the European MAC satellite transmission system, Philips (represented by Valvo in Germany) has agreed on a cooperative effort jointly with two other European companies. On the basis of designs from the Norwegian engineering firm of Nordic VLSI, Plessey Semiconductors Ltd. will produce the MAC decoder chip assembly and Philips will supplement this program with the appropriate bipolar circuits and controllers. The complete chip assembly will be marketed by Plessey and Philips. It will be the first multistandard IC assembly that can handle both C, D, and also D2MAC. That is, in addition to the transmissions of "Astra," BSB, TDF, TV-Sat, and Tele-x, also encompassed are all future transmissions based on the MAC package method. The system design is independent of existing television chassis, so that the equipment developers are given total freedom in the implementation of the concept in their sets. According to data from Valvo, because of the system architecture chosen the decoder will be comparable in its price/performance ratio to so-called one-standard concepts. [Text] [Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 24 Sep 87 p 8] 12114

CSO: 36980043

EEC'S COMETT PROJECT FUNDING S&T TRAINING

Brussels EEC PRESS RELEASE in English No IP(87) 312, 21 Jul 87 pp 1-6

[Text] Partnerships between universities and European industry are popular in 1987: this is one of the main outcomes of the launch of the COMETT programme--the Community programme on cooperation between universities and enterprises regarding training in the field of technology--of which the first list of projects to receive Community aid has just been published by the EEC Commission.

Industry and the university world expressed keen interest in this programme following the call for applications published at the end of 1986 which provides for two rounds of applications in 1987. In all 500 applications covering over 1500 university-industry cooperation schemes were lodged with the Commission by 31 March 1987, the closing date for submission of the first round of applications.

Overall, within all the Member States, over 1000 universities or higher education establishments have cooperated in training projects with over 1500 firms, including small and medium-sized firms in sectors ranging from information technology, industrial technology and the transfer and management of technology in addition to almost another 300 public or private bodies.

It is therefore impossible to give a full list of the institutions participating in this programme. Most of the large universities and higher education establishments in the Community are on the list, together with large and small firms engaged in activities related to advanced technologies such as Siemens, Philips, IBM, Marconi, Thomson, Hewlett-Packard, Aerospatiale, British Aerospace, Control Data, Digital, Fabrimetal, British Telecom and RTL, to name but a few.

The financial assistance requested totalled 85 million ECU and, given the limited resources available--13 million ECU for this year--an allocation of 5.8 million ECU was accorded for the first round.

Selection was very difficult and with the help of a group of experts and after consulting the COMETT Committee, the Commission decided to draw up the list of projects which is attached.

COMETT

First Application Round 1987

Financial Flows by Member State (ECU)

Member State	A Flow	B1 Flow	B2 Flow	C Flow	D Flow	Total
B	185,000	11,600	15,325	310,000	85,000	606,925
Dk	80,000	32,120	-	50,000	100,000	262,120
D	265,000	122,655	6,300	115,000	-	509,065
E	380,000	30,785	15,800	60,000	110,000	596,585
F	400,000	42,475	-	290,000	365,000	1,097,475
GR	105,000	5,400	20,100	50,000	-	180,500
IRL	70,000	41,910	11,400	25,000	-	148,230
I	270,000	51,230	-	80,000	90,000	491,230
L	40,000	-	-	115,000	-	155,000
NL	115,000	26,790	-	50,000	-	191,790
P	200,000	131,600	12,600	80,000	25,000	449,200
UK	445,000	136,320	42,027	155,000	275,000	1,053,347
	2,555,000	632,995	123,552	1,380,000	1,050,000	5,741,547
	70 UETP	217 students	15 fellows	45 projects	23 projects	

Section A

Participation by Member State in the 70 Accepted UETP

Number of UETP co-ordinated by country	Of which trans-nation.	Member States Participating											%
		B	D	DK	E	F	GR	IRL	I	L	NL	P	UK

The projects were selected on the basis of the following general criteria:
- their contribution to strengthening a European sense of identity,
- the extent of the firm's involvement,
- training in technologies,
- new initiatives,
- significance of small and medium-sized firms,
- design and management of the project overall.

The list relates to the five separate areas of specific action:

Section A : A European network of university-enterprise training partnerships (UETP) has been set up. Its aim is transnational cooperation in advanced training in technology. In some of the partnerships the regional aspect predominates, in others the sectorial aspect. Each represents a firm undertaking by several universities and enterprises, in association with Chambers of Commerce and Industry and professional associations.

Section B1: 217 transnational exchanges of trainees in firms.

Section B2: 15 transnational fellowships for university staff and staff of undertakings and business personnel.

Section C : 45 joint transnational ongoing training projects.

Section D : 23 multilateral initiatives for developing multimedia training systems.

Second round 1987.

A single figure demonstrates the success of the second round for which the closing date for applications was 1 July 1987: over 570 applications have been submitted. A full analysis of the results will be notified towards mid-November.

B	6	3	-			2	2			1		1		1	16 %
D	7	3	1		1	2	1		1	2			1	2	13 %
DK	2	-													4 %
E	10	1												1	33 %
F	12	7		1		5		1		3				3	29 %
GR	3	1										1		1	7 %
IRL	2	1										1		1	9 %
I	7	2	1			1		1						1	21 %
L	1	1	1	1			1								1 %
NL	3	3				1	2		1					1	10 %
P	5	2	2			2	1		1	1				2	9 %
UK	12	2					1		1	1		1			36 %
	70	26	5	2	1	13	8	2	4	8	-	4	1	13	

Section B1

Accepted Projects: Sending and Receiving Member States

IMPORTANT: This table is provisional. The exact final distribution of students by Member State will be determined after conclusion of the contractual arrangement for accepted projects.

Sending Country	Number of students	Receiving country B	D	DK	E	F	GR	IRL	I	L	NL	P	UK
B	10		3		1	3			1		1	1	
D	33	1			5	13	1	1				1	11
DK	13						1				1		11
E	22	3	5			5	2	1	1		1		4
F	28		8	1	3				6	1			9
GR	10	1	1	1		1			1		3		2
IRL	14(*)		7										1
I	22	1			2	8	3	3					5
L	1												1
NL	12		2	1	1	1	1		2				4
P	12	1					1						10
UK	40	1	8	2	8	14			4			3	
	217	8	34	5	20	45	9	5	15	1	6	5	58

(*) Includes 6 students where the Member State destination has still to be decided.

Section B2

Accepted Projects: Sending and Receiving Member States

Sending country	Number of fellows.	Receiving country B	D	DK	E	F	GR	IRL	I	L	NL	P	UK
B	2					1					1		
D	1				1								
DK	-												
E	2		1										1
F	-												
GR	2					1					1		
IRL	1										1*		
I	1												1
L	-												
NL	-												
P	2												2
UK	4		1			1			1		1		
	15	-	2	-	1	3	-	-	1	-	4*	-	4

* or 1 to UK.

Section C

Participation by Member State in the 45 Accepted Projects

Applicant country	Number of projects	Member States participating B	D	DK	E	F	GR	IRL	I	L	NL	P	UK	%
B	10		5	1	6	8		1	4		2	1	3	53%
D	2	1		2		1						1	1	38%
DK	1												1	20%
E	2	1	1	1							2	2	1	47%
F	14	5	2	1	9		3	1	4	1	2	3	5	60%
GR	2	1						1	1					13%
IRL	2		1	1							1		2	16%
I	2		2								1		1	33%
L	3	2	1		1	3			1				1	9%
NL	1	1		1								1	1	27%
P	2	2	2	1	2	1		1	2				2	22%
UK	4	1	1		1		1	1	1		3			49%
	45	14	15	8	19	13	4	5	13	1	11	8	18	

Section D

Participation by Member State in the 18 Proposed Projects

Applicant country	Number of projects	Member States participating												%
		B	D	DK	E	F	GR	IRL	I	L	NL	P	UK	
B	1						1		1		1		1	35%
D	-													30%
DK	1	1			1									13%
E	2		1			2							1	35%
F	10	4	4	1	4		2	1	3		2	1	6	70%
GR	-													26%
IRL	-													4%
I	2					1							1	35%
L	-													-
NL	-													26%
P	1												1	22%
UK	6	2	2	1	2	3	3		2		3	3		70%
	23	7	7	2	6	6	6	1	6	-	6	4	10	

CSO: 3698/A309-E

EC ANNOUNCES NEW BRITE PROJECTS

Background Statement

Brussels EEC PRESS RELEASE in English No IP(87) 389, 24 Sep 87 pp 1-4

[Article: "Advanced Technologies for Traditional Industry: European Commission Approves New BRITE Projects"]

[Text]

Launched in 1985 as a four-year programme to increase the use of advanced technologies in the traditional sectors of industry, the BRITE programme has already achieved, after two years a climate of cooperation in industrial technology and has contributed to establish the base of a new competitiveness for European companies.

The European Commission has just approved 112 new projects for BRITE, selected out of 471 research proposals submitted. Out of those, 46 projects will receive Community funding up to a total of 45 Million ECU as soon as contract has been finalised. The remaining 66 projects may receive up to 60 million ECU as soon as the Twelve have formally approved the revision of BRITE proposed by the European Commission.

The Community contribution amounts to 50% of the costs of each project, with a matching sum provided by the industrial partners. The average cost of each project is 1.960.000 ECU.

The 112 projects will involve 573 participating organisations of which 60% are industrial firms, 24.8% are research institutes and 16.2% are universities. 41% of the industrial partners are small or medium-sized enterprises, a significant increase compared with the first round of BRITE when 30% of the industrial partners were SMEs.

This second round of BRITE confirms the growing interest in this programme: no less than 2230 organisations were represented in the 471 research proposals, and while 112 were selected according to very exacting criteria, many more were of a sufficiently high standard to merit financial support if additional funding was available.

Examples of new BRITE projects

BRITE projects cover a wide range of industrial sectors and technical disciplines, often making surprising use of techniques developed in one area to make new applications in another. A few examples will illustrate typical BRITE projects.

A Dutch chemical manufacturer has teamed up with laser specialists in the United Kingdom to develop new optical recording materials based on polymers. Unlike existing photographic films, these new materials will not need chemical processing, and will have the advantage of erasability.

Irish, Belgian, Italian and Dutch partners will be developing a prototype unmanned knitting plant (including the development of special yarns, new systems for yarn feeding, the automatic removal of knitted pieces, and fault detection/correction). This consortium includes a yarn spinner, a machine builder, knitting SMEs, a knitting industry association and specialist research institutes.

A project which brings together research institutes in seven Member States (together with an industrial sponsor), concerns the development of self-stratifying paint which will allow the application of primer and topcoat layers to be made in a single coating. (UK,F,B,D,IRL,DK,NL)

Lasers will be used to treat the surfaces of alloy components in steam and gas turbines in order to improve wear and resistance to corrosion. This technique will have wider engineering applications. In this project partners in five Member States are joined by one in Finland. (GR,DK,D,F,UK,FIN)

Another example of injecting new technology into a more traditional industrial sector is a project to extend the use of computer-aided design and manufacturing techniques in shipbuilding, especially for engineroom design, piping arrangement and cabin layout. (GR,B,NL,D)

Polymer science and cell biochemistry will join together in the development of an artificial blood vessel for cardiovascular implants. For the first time, an attempt will be made to colonize a synthetic polymer with human endothelial cells. (SP,F,D)

Partners in four Member States will be working on a picture-processing system which will recognise and classify defects (pattern, structure, sheen, colour) in close and loosely-woven fabrics without coming into contact with the material itself. (PO,DK,B,D)

Background

BRITE is a four-year programme of collaborative research funded jointly by the European Community and industry. It was designed to encourage European manufacturing industries to equip themselves with the technological base necessary to regain their competitiveness.

It does this by promoting Community-wide industrial R&D on promising, new projects and in a framework of international cross-border cooperation which brings together industrial firms, universities and research institutes. As well as EC Member States, EFTA countries are also encouraged to participate.

The research is "precompetitive" in nature, with commercial product development being left entirely to industry. The technical content of BRITE was drawn up in consultation with industry, and deliberately reflects the specific requirements of the European market. Attention was focussed on new manufacturing techniques and new materials, and nine key technological fields were given priority:

- Improved reliability of industrial materials, components and systems;
- Laser technology as a production tool;
- New material joining techniques;
- New testing methods, often computer-based and used on production lines and in continuous processes;
- Advanced design and manufacturing techniques, especially for SMEs;
- Applications of advanced materials such as polymers, composites and ceramics;
- Membrane science and technology;
- Catalysis and particle technology;
- Automated processing and assembly of flexible materials leading to the automated manufacture of clothes and shoes.

Projects in these areas are evaluated by a panel of independent experts from industry and the academic world. Each one must have partners from at least two EC member states, and preference is given to those with more than one industrial partner. SME's are particularly encouraged to participate.

Projects selected receive Community funding for up to 50 % of the cost of personnel, equipment and materials, the balance being met by the industrial partners. The typical cost is between 1.0 and 2.5 mio ECU. In the first round of BRITE 103 projects with 495 participants were selected for Community support totalling 65 mio ECU.

Industrial property generated within a project is owned by the contractors concerned, but licenses to use research results obtained in BRITE projects must be granted in certain circumstances (subject to agreed terms) to other BRITE contractors and others involved in Community R&D generally. Results should be exploited as soon as practicable, otherwise there is an obligation to allow others to use them.

What has BRITE achieved so far ?

BRITE has only been running since 1985, but it has already succeeded in creating a climate of cooperation in industrial technology, and has therefore contributed to the development of a genuine common market inside the Community.

It is too early to pinpoint research results for each of the projects in the first round, but it is clear that many of them have already made striking progress. A few examples will illustrate the point:

Automated assembly of garments

The partners in this project are developing a robotic handling system which can carry out as many sewing and assembly operations as possible in two-dimensions, and under automatic control.

Remarkable progress has been made in the areas of ply-separation (removing single pieces from a stack of pieces cut to the same shape), sewing thread monitoring (to achieve a continuous-sewn seam while changing the bobbin), and the development of a new sewing system. The construction of a prototype robot will be completed by the end of 1987.

Partners: Courtaulds (UK)
GEC (UK)
PFAFF (D)

Low-cost automation of arc welding

This project led to the development of a prototype computer-controlled arc-welding robot for use in the shipbuilding industry. It includes a special fumebox to protect operators and the environment from ozone and other fumes released during welding. Measurements of these gas emissions have been completed, and a common standard will be proposed to European industry.

Welding tests were conducted on steel coated with anti-corrosion primers to determine optimum operating conditions: welding speed, primer composition and coating thickness. The results may be used to establish an industrial norm for primer coating in the shipbuilding industry.

Partners: Odense Steel Shipyard (DK)
Carl Cloos Schweisstechnik (D)
Danish Welding Institute (DK)
British Maritime Technology (UK)
Hempel Technology (DK)
RWTH Aachen (D)

Simulation of injection moulding

A new mathematical model has been successfully developed to simulate injection moulding for the production of plastic parts, making a significant step forward in the field.

It describes the process more precisely than existing models, taking into account that the plasic flow is three dimensional and time-dependent. It also takes account of the heat transfer between the hot polymer plastic and the cold walls of the mould.

In combination with existing computer-aided design facilities, this new model will lead to greater precision in injection moulding, bringing a reduction in both the cost and development time of new products.

Partners : La Telemechanique (F)
Univ. Catholique de Louvain (B)
Univ. College Wales (UK)

Membrane technology for water treatment

In this project, Dankse Sukkerfabrikker (DK) and Société Lyonnaise des Eaux (F), together with University partners, have pooled their expertise in the development of composite and hollow-fibre membranes in order to determine the best membrane for specific applications.

The main use of these membranes is for the ultrafiltration of "raw" waters (tap water, river water, coagulated water, turbulent bioreactors and activated sludge) to obtain ultrapure or drinking water. Other applications are foreseen in the food, dairy and pharmaceutical industries.

The project has made significant progress towards a breakthrough in membrane technology, and Danske Sukkerfabrikker will shortly be sending a membrane module to Société Lyonnaise des Eaux for on-site testing at a plant which supplies drinking water to Paris.

Partners: Danske Sukkerfabrikker (DK)
Société Lyonnaise des Eaux (F)
Univ. College Wales (UK)
Danish Technical University (DK)
Imperial College, London (UK)

Brussels EEC PRESS RELEASE in English No IP(87) 389, 23 Sep 87 pp 1-40

[Text] AREA 1 - RELIABILITY,WEAR AND DETERIORATION 87- 9-23
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P-2023-1-87 TITLE : STUDY OF INTERNAL RECIRCULATION IN ROTO-DYNAMIC PUMPS OPERATING AT PARTIAL CAPACITY IN ORDER TO IMPROVE THEIR RELIABILITY AND THEIR HYDRO-MECHANICAL BEHAVIOUR BY ADAPTING LASER VELOCIMETRY TO THE PROBLEM.

****

FKM	D	*	PRIME PROPOSER
EG PUMPEN	D	*	
SYND. CONST. POMPES	F	*	Dr. H. SPAMER & ZIMMER
IN DARMSTADT	D	*	LYONER STR.18 POSTFACH 710.864
CETIM	F	*	D -6000 FRANKFURT 71
KLEIN, SCHANZLIN & BECKER AG	D	*	
SULZER-WEISE GMBH	D	*	TELEP : 69/6603.281/315
		*	TELEX : 411.321
		*	FAX : 69/6603.511
		*	

****

P-2038-1-87 TITLE : DEVELOPMENT OF STEELS HAVING A HIGH ALUMINIUM CONTENT ARE RESISTANT TO WEAR AND TO ENVIRONMENT THAT ARE SUBJECT TO
+ HOT CORROSION APPLICATIONS TO COATINGS.

****

CEA/CENG	- F	*	PRIME PROPOSER
CSM	- I	*	
ARMINES	- F	*	Ing.A. LEFORT
OSPREY METALS LTD	- UK	*	85 X
UNIREC	- F	*	F -38041 GRENOBLE CEDEX
CRM	- B	*	
		*	TELEP : 76.88.32.90
		*	TELEX : 320323
		*	FAX : 76.88.51.52
		*	

****

P-2052-1-87 TITLE : SURFACE CHANGES TO TITANIUM ALLOYS CAUSED BY INORGANIC MATERIALS USED FOR ORTHOPAEDIC IMPLANTS : REHABITABLE POROUS COATINGS, RUBBING SURFACES.

****

CEA/CENG	F	*	PRIME PROPOSER
THACKRAY ORTHOPAEDIC LTD	UK	*	
LABOR.DE RECHERCHES ORTHOPEDIQUES	F	*	Dr. C. MOREAU
		*	85 X
		*	F -38041 GRENOBLE CEDEX
		*	
		*	TELEP : 76.88.43.45
		*	TELEX :
		*	FAX :
		*	

****

P-2058-1-87 TITLE : USE OF MICROENCAPSULATION TECHNIQUES IN PAINT SYSTEMS.

AEROSPATIALE	F	*	PRIME PROPOSER
INTERNATIONAL CELOMER S.F.P.V.	F	*	
TNO	NL	*	Mr. N.J. BRAUDEL & J.J. BOMM
IRAP	F	*	12 RUE PASTEUR Bp Nx 76
		*	F -92152 SURESNES CEDEX
UNIV ATHENS	GR	*	
		*	TELEP : 33/1/47283376
		*	TELEX : 620.059
		*	FAX : 33/1/47727771
		*	

P-2085-1-87 TITLE : FREEZE/THAW DURABILITY OF CONCRETE PAVING BLOCKS.

CEMENT AND CONCRETE ASSOCIATION	UK	*	PRIME PROPOSER
VEREIN DEUTSCHER ZEMENTWERKE E.V.	D	*	
FABRICHE RIUNITE CEMENTO SPA	I	*	Dr. T.A. HARRISON
CONCRETE BLOCK PAVING ASSOC.	UK	*	WEXHAM SPRINGS
UNIV BRISTOL	UK	*	UK -SL3 6PSLOUGH
BAUSTOSSWERKE KG	D	*	
		*	TELEP : 2816/2727
		*	TELEX : 848352
		*	FAX : 2816/2251
		*	

P-2121-1-87 TITLE : NOVEL "INTELLIGENT" METHOD FOR THE RATIONAL QUALIFICATION AND SELECTION OF RELIABLE SUBSEA HYDROCARBON PRODUCTION EQUIPMENT.

GERTH	F	*	PRIME PROPOSER
BP PETROLEUM DEVELOPMENT LTD	UK	*	
CONTROLE ET PREVENTION	F	*	Mr. PH. RAUCH
UNIV BRADFORD	UK	*	4 AVENUE DE BOIS PREAU
		*	F -92500 REIL MALMAISON
		*	
		*	TELEP : 33/59.83.57.18
		*	TELEX : 560804
		*	FAX : 33/59.83.45.11
		*	

P-2124-1-87 TITLE : ENHANCEMENT OF INSPECTION AND MAINTENANCE OF INDUSTRIAL STRUCTURES USING RELIABILITY BASED METHODS AND EXPERT SYSTEMS.

GERTH	F	PRIME PROPOSER
A.T.B	I	
FRAMATOME	F	Mr. D. BERGEZ
JOINT RESEARCH CENTER	J	4 AVENUE DE BOIS PREAU
KRAFTWERK UNION	D	F -92502 RUEIL MALMAISON
OIL CONSULT / CSR	DK	
SYNTHESIS	I	TELEP : 33/59.83.65.05
TU MUENCHEN	D	TELEX : 560804
		FAX : 33/59.83.65.11

P-2133-1-87 TITLE : STEERED ARC ION PLATING FOR THE DEVELOPMENT OF NEW TERNARY AND QUARTERNARY CERAMIC COATINGS FOR CUTTING AND FORMING TOOLS.

GOTTLIEB GUEHRING	D	PRIME PROPOSER
HAUZER TECHNO COATING EUROPE BV	NL	
K.U LEUVEN	B	Mr. J. EBBERINK
		HERDERSTRASSE 54
		D -7470 ALBSTADT 1
		TELEP : 7431/17175
		TELEX : 763843
		FAX : 7431/17279

P-2136-1-87 TITLE : WEAR AND FATIGUE CHARACTERISTICS OF SURFACE ENGINEERING MATERIALS AS APPLIED TO MULTIPOINT AND SHEAR ACTION CUTTING TOOLS.

NEILL TOOLS LTD	UK	PRIME PROPOSER
IIRS	IRL	
TEKSCAN LTD	IRL	Mr. K. PASCOE
NIHE DUBLIN	IRL	HANDSWORTH ROAD
UNIV DURHAM	UK	UK -S1 1WBSHEFFIELD
ADVANCED SURFACE ENG. TECHNOLOGIES LTD	UK	
SHEFFIELD CITY POLYTECHNIC	UK	TELEP : 742/449911
SHEFFIELD CITY POLYTECHNIC	UK	TELEX : 54278
		FAX : 742/431360

P-2137-1-87 TITLE : NOVEL SURFACE ENGINEERING TECHNIQUES FOR ADVANCED MULTI-LAYER THIN FILM RECORDING MEDIA.

THORN EMI CENTRAL RESEARCH LABO.	UK	* PRIME PROPOSER
ICI FILMS	UK	*
ISTITUTO GUIDO DONEGANI SPA	I	* Dr. A. VAIDYA
		* DAWLEY ROAD
		* UK -UB3 1HHAYES, MIDDLESEX
		*
		* TELEP : 1/848.64.14
		* TELEX : 934135
		* FAX : 1/848.65.65
		*

P-2148-1-87 TITLE : COMPATIBILITY OF ECONOMIC MANUFACTURING METHODS WITH WEAR AND FATIGUE RESISTANCE OF SILICON NITRIDE BASED CERAMIC
+ BALL BEARING COMPONENTS FOR CRITICAL APPLICATIONS.

ELEKTROSCHMELZWERK KEMPTEN GMBH	D	* PRIME PROPOSER
SNR ROULEMENTS	F	*
		* Dr. D. STEINMANN
		* P.O BOX 1526
		* D -8960 KEMPTEN/ALLGAEU
		*
		* TELEP : 831/680218
		* TELEX : 54839
		* FAX : 831/680267
		*

P-2182-1-87 TITLE : THE DEVELOPMENT OF AN ION IMPLANTATION PROCESS AS APPLIED TO THE IMPROVEMENT OF SERVICE LIFE AND RELIABILITY OF ROLLING BEARINGS IN GAS TURBINE ENGINES.

RHP BEARINGS LTD	UK	* PRIME PROPOSER
WHICKHAM ION BEAM SYSTEMS LTD	UK	*
UNIV DURHAM	UK	* Dr. J.M HAMPSHIRE
LHETI	PO	* PO BOX 18
ROLLS ROYCE PLC	UK	* UK -NG24 2NEWCASTLE UPON TYNE
UNIV LYON I	F	*
		* TELEP : 636/605123
		* TELEX : 377652
		* FAX : 636/605000
		*

P-2280-1-87 TITLE : OPTIMIZATIONS OF CERAMIC ZIRCONIA POWDERS FOR THERMAL BARRIER COATING IN IC ENGINES.

ELPAR BV	NL	PRIME PROPOSER
TH AACHEN	D	
UNIV LIMOGES	F	Ing.M. DANIELS
PLASMA-TECHNIK LTD	UK	SPIKEWEG 34 IND.TERR."SPIKWEIE
SPONSORS	D	NL -5943 LOMM
		TELEP : 4703/2664
		TELEX : 50876
		FAX : 4703/2785

P-2297-1-87 TITLE : DEVELOPMENT OF PISTON-RING RUBBING SURFACES BY MEANS OF NEW COATING AND SURFACE (TREATMENT) TECHNIQUES FOR APPLICATION TO TRIBOLOGICALLY VERY HIGHLY STRESSED LARGE 4-STROKE DIESEL ENGINES.

GILARDINI	I	PRIME PROPOSER
MAN B&W DIESEL GMBH	D	
		Ing. CAPEZZUOLI
		VIA SAN QUIRICO 19
		I -16143 GENOVA
		TELEP : 10/710825
		TELEX : 27256
		FAX : 10/711380

P-2335-1-87 TITLE : SELF STRATIFYING COATING.

PAINT RESEARCH ASSOCIATION	UK	PRIME PROPOSER
CERIPEC	F	
COATINGS RESEARCH INSTITUTE	B	Mr. J.A PERRIE
FORSCHUNGSINSTITUT FUR PIGMENTE &LACKE	D	8 WALDEGRAVE ROAD TEDDINGTON
IIRS	IRL	UK -TW11 8HIDDLESEX
SCAND. PAINT & PRINTING INK RES.INST.	DK	
TECHNOLOGICAL INSTITUTE TAASTRUP	DK	TELEP : 1/977.4427
TNO	NL	TELEX : 929720
INDUSTRIAL SPONSORS	DK	FAX : 1/943.4705

P-2341-1-87 TITLE : PERFORMANCE AND RELIABILITY EVALUATION OF WELDMENTS IN ELEVATED TEMPERATURE SERVICE.

ERA TECHNOLOGY LTD	UK	*	PRIME PROPOSER
CEGB	UK	*	
INASMET	SP	*	Mr. G.B THOMAS
ICI	UK	*	CLEEVE ROAD, LEATHERHEAD
TECHATOM SA	SP	*	UK -KT22 7SURREY
BAM	D	*	
BABCOCK AND WILCOX ESPANOLA	SP	*	TELEP : 372/374151
ENEL CRIN	I	*	TELEX : 264045
		*	FAX : 372/374496
		*	

P-2381-1-87 TITLE : DEVELOPMENT OF METHODOLOGIES, BASED ON REAL TIME INTELLIGENT ON-LINE MULTI-CHANNEL DATA ACQUISITION, WHICH DETERMINE THE ACCUMULATED FATIGUE DAMAGE & THE RESIDUAL LIFE TIME OF STRUC. OR WHICH VALIDATE & UPDATE MATHEM. MODELS.

INTESPACE	F	*	PRIME PROPOSER
DYNAMIC ENGINEERING	B	*	
LEMMENS ELEKTRONIKA NV	B	*	Mr. J.F IMBERT
BRITISH MARITIME TECHNOLOGY LTD	UK	*	18 AV EDOUARD BELIN BP 4356
UNIV HANNOVER	D	*	F -31029 TOULOUSE
ASEA NV	B	*	
REG. NIEDERSACHSEN	D	*	TELEP : 61.27.36.76
		*	TELEX : 530178
		*	FAX : 61.27.48.25
		*	

P-2412-1-87 TITLE : SILICON-CARBIDE-SILICON NITRIDE COMPOSITE COATINGS WITH IMPROVED ADHESION PROPERTIES PRODUCED BY A PLASMA-ENHANCED CVD PROCESS.

XYNETICS TEMPRESS BV	NL	*	PRIME PROPOSER
TNO	NL	*	
IIRS	IRL	*	Mr. R.B. KOEKOEK
TEKSCAN LTD	IRL	*	PO BOX 151/HOBCONISTRAAT 14
		*	NL -7903 AG HOOGEVEEN
		*	
		*	TELEP : 5280/98200
		*	TELEX : 42275
		*	FAX : 5280/73933
		*	

P-2417-1-87 TITLE : RELIABILITY OF BULK CERAMICS FATIGUE BEHAVIOUR IN CORROSIVE MEDIA.

RENAULT	F	* PRIME PROPOSER
PEUGEOT SA	F	*
VOLKSWAGEN AG	D	* Dr. G. DESPLANCHES
ARMINES	F	* 8/10 AV EMILE ZOLA
FRAUNHOFER GESELLSCHAFT	D	* F -92109 BOULOGNE
		*
		* TELEP : 1/46.09.79.60
		* TELEX : 204000
		* FAX : 1/47.61.12.43
		*

P-2418-1-87 TITLE : IMPROVEMENT OF THE CONTACT CORROSION BEHAVIOUR OF ADVANCED MECHANICAL STRUCTURES MADE FROM HIGH-GRADE ALLOYS

SNECMA	F	* PRIME PROPOSER
INSA LYON	F	*
KHD LUFTFAHRTTECHNIK	D	* Mme C. CHAMONT
		* BP 81 ROUTE NATIONALE 7
		* F -91003 EVRY CEDEX
		*
		* TELEP : 1/69.87.98.42
		* TELEX : 600.700
		* FAX : 1/69.87.89.28
		*

P-2455-1-87 TITLE : SINTERED METAL FRICTION LININGS FOR HEAVY DUTY APPLICATIONS.

METAFRAM	F	* PRIME PROPOSER
UNIV CATHOLIQUE DE LOUVAIN	B	*
		* Dir. H. YOUSSEF
		* 53 CHAUSSEE JULES CESAR
		* F -95250 BEAUCHAMP
		*
		* TELEP : 33/1/39956822
		* TELEX : 695951
		* FAX : 33/1/39952336
		*

P-2112-2-87 TITLE : POWER SOLID STATE LASER WITH HIGH BEAM QUALITY BASED ON CODOPED LANTHANUM HEXA-ALUMINATE (LNA)

CEA-IRDI	F	* PRIME PROPOSER
CISE	I	*
QUANTEL	F	* Mr. J.J AUBERT
QUANTA-SYSTEM	I	* 85 X
		* F -38041 GRENOBLE CEDEX
		*
		* TELEP : 76.88.48.24
		* TELEX : 320.323
		* FAX : 76.46.88.15
		*

P-2178-2-87 TITLE : LASER TREATMENT AS A TOOL FOR TAILORING THE SURFACE COMPOSITION OF ALLOY COMPONENTS FOR ENGINEERING APPLICATION.

+

MIRTEC S.A.	GR	* PRIME PROPOSER
DANISH CORROSION CENTRE	DK	*
DANISH WELDING INSTITUTE	DK	* Mr. D. TSIPAS
MAN	D	* A' INDUSTRIAL AREA OF VOLOS
ALSTHOM	F	* GR -38500 VOLOS
LABOR.DE MARCOUSSIS	F	*
CEGEDUR PECHINEY	F	* TELEP : 30/421/95340/1
UKAEA CULHAM LABORATORY	UK	* TELEX : 0282348
RESEARCH CENTER OF CRETE	GR	* FAX : 30/421/95364
UNIV LAPPEENRANTA	FIN	*

P-2348-2-87 TITLE : HEAVY SECTION LASER WELDING.

+

RIM	I	* PRIME PROPOSER
ETAB. TECHNIQUE CENTRAL DE L'ARMEMENT	F	*
FRAUNHOFER GESELLSCHAFT	D	* Dir G. RICCIARDI
ANSALDO COMPONENTI	I	* REG. LIME
ENEA	I	* I -10080 VICO CANAVESE
CSIC CENIM	SP	*
CETIM	F	* TELEP : 125/74362-74598
LABOR.DE MARCOUSSIS	F	* TELEX : 222321
CREUSOT LOIRE INDUSTRIE	F	* FAX : 125/75755
SCIAKY SA	F	*

P-2357-2-87 TITLE : LASER SURFACE TREATMENT OF MECHANICAL COMPONENTS FOR IMPROVED MECHANICAL AND PHYSICAL PROPERTIES.

CETIM	F	*	PRIME PROPOSER
FRAMATOME	F	*	
RTM	I	*	Mr. J.P NAYLOR
AERITALIA	I	*	52 AV FELIX LOUAT
ANSALDO COMPONENTI	I	*	F -60304 SENLIS
ENEA	J	*	
IMPERIAL COLLEGE OF SCIENCE & TECHNOL	UK	*	TELEP : 44.58.32.71
BL TECHNOLOGY LTD	UK	*	TELEX : 140006
ROLLS ROYCE PLC	UK	*	FAX : 44.58.34.00
PEUGEOT SA	F	*	

P-2162-3-87 TITLE : DEVELOPMENT OF IMPROVED BONDING TECHNOLOGY FOR NEW ENGINEERING CERAMICS AND METALS.

+

GEC (UK) *
INST.BELGE DE LA SOUDURE (B) *
BHP LABORATORIES LTD (IRL) *

PRIME PROPOSER

Mr. G. PARTRIDGE
LICHFIELD ROAD PO BOX 30
UK -ST17 4STAFFORD

TELEP : 785/56221
TELEX : 36201
FAX : 785/56221

P-2281-3-87 TITLE : NEW BRAZE FILLER MATERIALS AND BRAZE TECHNIQUES FOR JOINING FERRITIC AND AUSTENITIC STEELS AND SUPERALLOYS WITH BETTER MECHANICAL AND CORROSION PROPERTIES.

+

ELBAR BV (NL) *
RISO NATIONAL LABORATORY (DK) *
RWTH AACHEN (D) *
PASILAC A/S (DK) *
SPONSORS (D) *

PRIME PROPOSER

Ing.L. BAUTMANS
PO BOX 4339
NL -5944 ARCEN

TELEP : 4703/2666
TELEX : 58876
FAX : 4703/2785

P-2294-3-87 TITLE : ELECTRON BEAM WELDING ON LARGE THICKNESS STEEL FOR HEAVY INDUSTRY.

FRAMATOME (F) *
CREUSOT LOIRE INDUSTRIE (F) *
GEC TURBINE GENERATION LTD (UK) *
RWTH AACHEN (D) *
SPONSORS (D) *

PRIME PROPOSER

Mr. J. BINARD
BP 13
F -71380 SAINT MARCEL

TELEP : 85.96.30.00
TELEX : 800.668
FAX : 85.96.31.31

P-2309-3-87 TITLE : JOINING TECHNIQUES FOR RELIABLE SURFACE MOUNTING OF MICRO-ELECTRONICS.

GEC RESEARCH LTD	UK	*	PRIME PROPOSER
AEG AG	D	*	
PHILIPS VALVO GMBH	D	*	Mr. R.M QUILLIAM
INASMET	SP	*	WEST HANNINGFIELD ROAD
		*	UK -CM2 8HGREAT BADDOW ESSEX
		*	
		*	TELEP : 245/73331
		*	TELEX : 995016
		*	FAX : 245/75244
		*	

P-2409-3-87 TITLE : INVESTIGATION OF NOVEL COPPER PHOSPHORUS SYSTEM FOR BRAZING STEELS.

COMPTOIR LYON ALEMAND LOUYOT	F	*	PRIME PROPOSER
UNIV BRADFORD	UK	*	
ARMINES	F	*	Mr. J.P GUERLET
STICHTING GEAVANCEERDE METAAL KUNDE	NL	*	8 RUE PORTEFOIN
GEC	UK	*	F -75003 PARIS
MANGANESE BRONZE	UK	*	
		*	TELEP : 1/42.77.11.11
		*	TELEX : 220.514
		*	FAX : 1/42.77.03.58
		*	

P-2031-4-87 TITLE : OPTIMISATION AND CONTROL OF ACRYLIC FIBRE SURFACE AND CRIMP CHARACTER FOR MODERN YARN SPINNING PROCESSES.

COURTAULDS RESEARCH	- UK	* PRIME PROPOSER
ENICHEM FIBRE	- I	*
MONTEFIBRE SPA	- I	* Dr. P.J. AKERS
COURTAULDS FIBRES SA	- SP	* PO BOX 111 LOCKHURST LANE
SHIRLEY INSTITUTE	- UK	* UK -CV6 5RCOVENTRY
		*
		* TELEP : 203/688771/2221
		* TELEX : 312171
		* FAX : 203/688771/2187
		*

P-2032-4-87 TITLE : DEVELOPMENT OF ACOUSTIC EMISSION (AE)TESTING METHODS FOR ANALYSIS AND ON LINE MONITORING OF STRESS CORROSION CRACKING (SCC) UNDER OPERATING CONDITIONS IN THE CHEMICAL INDUSTRY.

RHONE POULENC	- F	* PRIME PROPOSER
BAYER	- D	*
FRAUNHOFER GESELLSCHAFT	- D	* Ing.A. FERAT
INSA LYON	- F	* 24 AV. JEAN JAURES BP 166
		* F -69151 DECINES CEDEX
		*
		* TELEP : 78.49.81.10
		* TELEX : 340.163 F
		* FAX : 78498110/4810
		*

P-2049-4-87 TITLE : DEVELOPMENT OF AN EXPERT SYSTEM FOR TOOL WEAR MONITORING IN MILLING, DRILLING AND BLANKING USING MULTI-SENSOR SYSTEM AND MACHINABILITY STUDIES USING ACOUSTIC EMISSION

GAYDON TECHNOLOGY LTD	- UK	* PRIME PROPOSER
CETIM	F	*
UNIV BRUNEL	UK	* Dr. J. DAVIES
TEKNIKER RESEARCH ASSOCIATION	SP	* BANBURY ROAD
CSIC IAI	SP	* UK -CV35 OLIGHTHORNE
CENTRE TECH.DE L'INDUST.DU DECOLLETAGE	F	*
COMPUTER TECHNOLOGIES CO LTD	GR	* TELEP : 926/641111
UNIV HERIOT-WATT	UK	* TELEX : 31331
INDUSTRIAL SPONSORS		* FAX : 926/641281
		*

P-2051-4-87 TITLE : X-RAY VOLUDENSITOMETRY. APPLICATION TO THE TESTING OF TECHNICAL CERAMICS

INTERCONTROLE
LETI
TELEFONICA
EIDOS
RENAULT
FAIREY TECRAMICS LTD

F PRIME PROPOSER
F
SP Mr. T KOCH
I 4 PLACE VAUBAN-SILIC 433
F F -94583 RUNGIS CEDEX
UK

TELEP : 1/46873160
TELEX : 270301 F
FAX : 1/46759259

P-2082-4-87 TITLE : DEVELOPMENT OF NON-INVASIVE METHODS FOR MEASUREMENT OF STRESS IN WELDED STEEL STRUCTURES

HARWELL LABORATORY
CISE
INDUSTRIAL SPONSORS
INDUSTRIAL SPONSORS

UK PRIME PROPOSER
I

Dr. K NEWTON
BLD 521, AERE HARWELL
UK -OX11 0QXFORDSHIRE

TELEP : 0235/24141
TELEX : 83135
FAX : 0235/832591

P-2103-4-87 TITLE : DEVELOPMENT OF NON-DESTRUCTIVE HIGH PRECISION TEST METHODS FOR ASPHERIC COMPONENTS AND TOOLS IN OPTICS

PHILIPS
UNIV STUTTGART
CERCO

NL PRIME PROPOSER
D
F

Ir. G PRAST
PO BOX 80000
NL -5600 JEINDHOVEN

TELEP : 40/744089
TELEX : 35000
FAX : 31/40/743783

P 2167-4-87 TITLE : OPTICAL SENSORS AND FIBRE OPTIC WAVELENGTH DIVISION MULTIPLEXING SYSTEMS FOR PROCESS CONTROL

FRAMATOME	F	PRIME PROPOSER
CEC	UK	
THORN EMI PLC	UK	Mr. G ANGLARET
INSTRUMENTS SA	I	TOUR FIAT CEDEX 16
SPECTEC	F	F -92084 PARIS LA DEFENSE
PHOTONIQUE INDUSTRIE	F	
		TELEP : 1/47962708
		TELEX : 630635
		FAX : 1/47963031

P 2172-4-87 TITLE : INNOVATIVE TRANSDUCERS FOR ADVANCED SIGNAL PROCESSING IN ULTRASONIC INSPECTIONS

KRAFTWERK UNION	D	PRIME PROPOSER
CEC	UK	
CISE	I	Mr. L VON BERNUS
UNIV STRATHCLYDE	UK	HAMMERBACHER STRASSE 12-14
IZFP	D	D -8520 ERLANGEN
UNIV ERLANGEN NUERNBERG	D	
		TELEP : 9131/18/2953
		TELEX : 62929/0
		FAX : 9131/18/4604

P-2177-4-87 TITLE : NON DESTRUCTIVE EVALUATION FOR THE PRE-INSTALLATION ASSESSMENT AND IN SITU INSPECTION OF WOODEN TRANSMISSION POLES

IRADA	UK	PRIME PROPOSER
UNIV MUENCHEN	D	
DANMARKS TEKNISKA HOJSKOLE	DK	Dir. A.R, ABBOTT
INDUSTRIAL SPONSORS	UK	STOCKING LANE HUGHENDEN VALLEE
INDUSTRIAL SPONSORS	D	UK -HP14 4BUCKINGHAMSHIRE
INDUSTRIAL SPONSORS	DK	
		TELEP : 024024/3091
		TELEX : 83292
		FAX :

P-2251-4-87 TITLE : "PROJECT OFELIA : OPTICAL FIBRES FOR ELECTRICAL INDUSTRY APPLICATIONS". DEVELOPMENT OF PASSIVE OPTO-ELECTRONIC
\+ SENSORS FOR MEASUREMENTS AND DIAGNOSTICS IN ELECTRICAL POWER SYSTEMS.

CESI	I	*	PRIME PROPOSER
CAVI PIRELLI SPA	I	*	
FECSA	SP	*	Mr. L IHIONE
SISTEMAS E INSTRUMENTACION SA	SP	*	VIA RUBATTINO 54
UNIV POLITECNICA CATALUNYA	SP	*	I -20134 MILANO
		*	
		*	TELEP : 2/2125351
		*	TELEX : 310097
		*	FAX : 2125440
		*	

P-2305-4-87 TITLE : MICROSTRUCTURAL AND RESIDUAL STRESS ANALYSIS OF METALLIC MATERIALS

GKN TECHNOLOGY	UK	*	PRIME PROPOSER
EQUIPOS NUCLEARES SA	SP	*	
ARMINES	F	*	Dr. J O TAYLOR
SGM	NL	*	BIRMINGHAM NEW ROAD
UNIV TWENTE	NL	*	UK - WOLVERHAMPTON
ECN	NL	*	
THYSSEN STAHL AG	D	*	TELEP : 902/334361
FRAUNHOFER GESELLSCHAFT	D	*	TELEX : 339724
		*	FAX : 902/334778
		*	

P-2318-4-87 TITLE : DEVELOPMENT OF A NON DESTRUCTIVE TEST METHOD BASED ON THE ACOUSTIC MICROSCOPY FOR THE ON LINE MONITORING AND THE RELIABILITY ASSESSMENT OF SEMICONDUCTOR DEVICES

ANSALDO SPA	I	*	PRIME PROPOSER
UNIV GENOVA	I	*	
UNIV MONTPELLIER	F	*	Mr. B PASSERINI
BERTIN & CIE	F	*	VIA N LORENZI 8
MARCONI ELECTRONIC DEVICES LTD	UK	*	I -16152 GENOVA
		*	
		*	TELEP : 10/4105234
		*	TELEX : 270318
		*	FAX : 10/444718
		*	

.5 AREA 4 - NEW TESTING METHODS 87- 9-23
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P-2400-4-87 TITLE : ACOUSTIC MEASUREMENTS OF CRACK PROPAGATION IN CERAMICS UNDER THERMOMECHANICAL LOADINGS

+

SOLVAY	B	* PRIME PROPOSER
DECHEMA	D	*
INSA LYON	F	* Mr. M CLERBOIS
FRAUNHOFER GESELLSCHAFT	D	* 310 RUE DE RANSBEEK
		* B -1120 BRUXELLES
		*
		* TELEP : 2/2662111
		* TELEX : 23678
		* FAX : 2/2663061
		*

P-2018-5-87 TITLE : INTEGRATED CAD/CAE SYSTEM FOR USE IN COLD SOLID-BLANK FORMING

INST.FUER PRODUKTIONSTECHNOLOGIE	D	PRIME PROPOSER
UNIV PADOVA	I	
TEKSID SPA	I	Prof W. KOENIG
DIEHL GMBH & CO	D	STEINBACHSTR 17
IFOA	I	D -5100 AACHEN MELATEN NORD
		TELEP : 241/8904/0
		TELEX : 08329411
		FAX :

P-2029-5-87 TITLE : NUMERICAL SIMULATION OF INDUSTRIAL SHEET FORMING PROCESSES

CENTRO INT. METODOS NUMERICOS EN ING.-	SP	PRIME PROPOSER
ROCKFIELD SOFTWARE LTD -	UK	
ESTAMPACIONES SABADELL S.A -	SP	Prof E. ONATE
CANDEMAT S.A -	SP	JORDI GIRONA SALGADO, 31
		SP -08034 BARCELONA
		TELEP : 93/204.82.52
		TELEX : 52821 UPC
		FAX :

P-2089-5-87 TITLE : ELECTRIC MOTORS DESIGN USING CAD TECHNIQUES RULES BY EXPERT SYSTEMS

+

LABEIN	SP	PRIME PROPOSER
ELORRIAGA	SP	
CEDRAT	F	Mr. S GOYARROLA
INP GRENOBLE	F	CUESTA DE OLABEAGA 16
		SP -48013 BILBAO
		TELEP : 34/44419300
		TELEX : 33018
		FAX : 944436171

P-2146-5-87 TITLE : RATIONAL PROCEDURE FOR ADVANCED NON LINEAR ANALYSIS OF FLOATING STRUCTURES

TECNOMARE SPA	I	PRIME PROPOSER
DANISH HYDRAULIC INSTITUTE	DK	
		Mr. C. FERRETTI
		SAN MARCO 2091
		I -30124 VENEZIA
		TELEP : 41/796711
		TELEX : 410484
		FAX : 41/796024

P-2150-5-87 TITLE : NUMERICAL AND EXPERIMENTAL TECHNIQUES FOR COMPOSITE MATERIAL, STRUCTURAL DESIGN AND VALIDATION IN ADVANCED
+ INDUSTRIAL APPLICATIONS

THOMSON	F	PRIME PROPOSER
ANSALDO SPA	I	
SIMULOG	F	Ing.G. VAN DER BORCK
ARS SPA	I	CHEMIN DU TRAVAIL BP 53
		F -06801 CAGNES SUR MER
		TELEP : 93200140
		TELEX : 204780
		FAX : 93731529

P-2156-5-87 TITLE : THE STUDY OF NON EQUILIBRIUM TWO PHASE FLOWS IN STEAM TURBINES

GEC	UK	PRIME PROPOSER
BERTIN & CIE	F	
TU ATHENS	GR	Dr. U K SINGH
UNIV BIRMINGHAM	UK	CAMBRIDGE ROAD / WHETSTONE
		UK -LE8 3LLEICESTER
		TELEP : 533/863434
		TELEX : 341626
		FAX : 533/865390

P-2183-5-87 TITLE : FINITE ELEMENT MODELLING OF FLOW AND HEAT TRANSFER DURING FOUNDRY MOULD FILLING

+

UNIV WALES SWANSEA (UK)
ALUMINIA (I)
KAYE PRESTEIGNE (UK)
CENTRE RECHERCHES PONT A MOUSSON (F)

PRIME PROPOSER

Prof.R.W LEWIS
SINGLETON PARK
UK -SA2 8PSWANSEA

TELEP : 792/295253
TELEX : 48358
FAX : 792/295532

P-2205-5-87 TITLE : MANUFACTURING COST REDUCTION THROUGH THE USE OF PREDICTIVE CONTROL TECHNIQUES FOR S.M.E. 'S IN DISCONTINUOUS MANUFACTURE OF POLYMER AND TEXTILE PRODUCTS.

MENTEC INTERNATIONAL LIMITED (IRL)
ADERSA (F)
NYPRO LTD (IRL)
ADRIA LTD (UK)

PRIME PROPOSER

Dir C. FAIRCLOUGH
CORRIG ROAD
IRL- DUBLIN

TELEP : 1/95.23.16
TELEX : 93309
FAX : 1/95.20.34

P-2210-5-87 TITLE : COMPUTER AIDED TECHNOLOGY FOR IMPROVED ACCURACY OF DROP FORGING TOOLS

INDUSTRIEVERBAND DEUTSCHER SCHMIEDEN (D)
ASS.IND. FORGES BELGES (B)
WTCM/CRIF (B)
UNIV LIEGE (B)
MEC (D)
FRAUNHOFER GESELLSCHAFT (D)
BELGIAN INDUSTRIE (B)

PRIME PROPOSER

Dr. H MEYER HOLKEMPER
GOLDENE PFORTE 1
D -5800 HAGEN

TELEP : 2331/51041
TELEX : 823806
FAX :

P-2289-5-87 TITLE : DEVELOPMENT OF A GENERAL COMPUTER AIDED TECHNIQUE FOR THE CHARACTERIZATION OF THE MICROPORE STRUCTURE OF INDUSTRIAL
+ POROUS MEDIA & DEVELOPMENT OF GENERAL NETWORK SIMULATORS F PREDICTION OF MULTIPHASE FLOW & TRANSPORT PHENOMENE...

GEOLOGICAL SURVEY OF DANMARK	DK	*	PRIME PROPOSER
DOWELL SCHLUMBERGER	F	*	
HALDOR TOPSOE A/S	DK	*	Mr. O W CHRISTENSEN
UNIV PATRAS	GR	*	31 THORAVEJ
DANMARKS TEKNISKA HOJSKOLE	DK	*	DK -2400 COPENHAGEN NV
		*	
		*	TELEP : 1/106600
		*	TELEX : 19999
		*	FAX :
		*	

P-2315-5-87 TITLE : THREE DIMENSIONAL COMPUTER SIMULATION OF IN CYLINDER FLOWS IN LARGE ENGINES

BERTIN & CIE	F	*	PRIME PROPOSER
CONCENTRATION HEAT & MOMENTUM LTD	UK	*	
RUSTON DIESELS LTD	UK	*	Ing. E. ZHATY
UNIV CALABRIA	I	*	BP 3
		*	F -78373 PLAISIR CEDEX
		*	
		*	TELEP : 1/34818700
		*	TELEX : 696231
		*	FAX : 1/30540414
		*	

P-2317-5-87 TITLE : EXPERIMENTAL, THEORETICAL AND COMPUTATIONAL ANALYSIS GAS AND PARTICLE BEHAVIOUR INSIDE A CYCLONE PROVIDING THE BASI FOR IMPROVED PERFORMANCE OF CYCLONES AND SIMILAR SEPARATORS

BERTIN & CIE	F	*	PRIME PROPOSER
FLOW SIMULATION LTD	UK	*	
VAN TONGEREN INTERNATIONAL BV	NL	*	Mr. J N DUMONT
LNETI	PO	*	ZONE INDUSTRIELLE DES GATINES
HOLLAND ENERGY TECHNOLOGY BV	NL	*	F -78373 PLAISIR CEDEX
		*	
		*	TELEP : 1/34818500
		*	TELEX : 696231
		*	FAX : 1/30540414
		*	

P-2319-5-87 TITLE : OPTIMIZATION OF NOISE CONTROL MEASURES IN COMPLEX LIGHTWEIGHT SHEETMETAL STRUCTURES BY USING ENERGY FLOW
+ ANALYSIS

PORSCHE AG	D	* PRIME PROPOSER
JAGUAR CARS PLC	UK	*
UNIV SOUTHAMPTON	UK	* Ing.W HANISCH
		* PORSCHESTRASSE
		* D -7251 WEISSACH
		*
		* TELEP : 07044/352533
		* TELEX : 7263763
		* FAX : 07044/352555
		*

P-2324-5-87 TITLE : COMPUTER INTEGRATED MANUFACTURING OF SYNTHETIC FIBERS

BARMAG AG	D	* PRIME PROPOSER
ENKA AG	D	*
ICI	UK	* Dr. K BAUER
RHONE POULENC	F	* LEVERKUSER STRASSE 65
FRAUNHOFER GESELLSCHAFT	D	* D -5630 REMSCHEID 11
DEUTSCHE INST.F TEXTIL -FASERFORSCHUNG	D	*
		* TELEP : 02191/609344
		* TELEX : 8513210
		* FAX : 2191/609204
		*

P-2331-5-87 TITLE : DEVELOPMENT AND TESTING OF NUMERICAL MODELS FOR JOINT DESIGN IN COMPOSITE MATERIAL STRUCTURES

STIN SPA	I	* PRIME PROPOSER
LUCIO ZOLLET AND C INGENIERA	I	*
MOLDING SYSTEMS SPA	I	* Dr. S MARTINELLI
METRAVIB	F	* VIA DELLA BUFALOTTA 336
UNIV OVIEDO	SP	* I -00139 ROMA
		*
		* TELEP : 6/8179844
		* TELEX : 620199
		* FAX :
		*

P-2351-5-87 TITLE : CREATION OF A POWERFUL MANAGEMENT AND CAD SOFTWARE OPTIMIZING THE POTENTIAL OF A SMALL SHIPBUILDING FIRM.

CHANTIERS NAVALS DE NAMECHE/SEILLES	B	PRIME PROPOSER
MAASDOK BV	NL	
LHCH	B	Mr. B DE GENTILE RUE DE REPPE 20 B -5210 SEILLES TELEP : 085/826912 TELEX : 59679 FAX :

P-2362-5-87 TITLE : MODELLING AND AUTOMATIC CONTROL OF THE POLISHING PROCESS (MACPOP)
+

BERTIN & CIE	F	PRIME PROPOSER
FRANKE ET CO OPTIK GMBH	D	
TAIGHDECLAR GENESIS TEORANTA	IRL	Mr. P MIDAVAINE
IIRIAM	F	BP 22,RUE 1 ARMAND
STEEG & REUTER	D	F -13762 LES MILLES CEDEX TELEP : 42/600111 TELEX : 420729 FAX : 42/600013

P-2380-5-87 TITLE : MATHEMATICAL MODULLING, COMPUTER AIDED SYNTHESIS AND OPTIMIZATION OF PERMANENT MAGNET EXCITED BRUSHLESS MOTOR DRIVES AND ACTUATORS TAKING INTO ACCOUNT ADVANCED MATERIALS AND TECHNOLOGY

PHILIPS VALVO GMBH	D	PRIME PROPOSER
UNIV SHEFFIELD	UK	
AUTOMATIC SYSTEMS LABORATORIES LTD	UK	Dr. E BOLTE POSTFACH 1980 D -5100 AACHEN TELEP : 241/6003266 TELEX : 17241500 FAX : 241/6003465

P-2385-5-87 TITLE : CAD/CAM FOR MARINE ENGINEERING PIPING AND ACCOMODATIONS IN SHIPBUILDING

+

BOELWERF SA	B	* PRIME PROPOSER
HELLENIC TECHNOLOGIES ELLTEC	GR	*
SCHICHAU UNTERWESER AKTIENGESELLSCHAFT	D	* Mr. R VERHASSELT
NUMERIEK CENTRUM GRONINGEN BV	NL	* DIJKSTRAAT
SCHIFFKO	D	* B -2690 TEMSE
		*
		* TELEP : 3/7107111
		* TELEX : 31140
		* FAX : 3/7714972
		*

P-2406-5-87 TITLE : INTEGRATION OF CAD/CAM AND PRODUCTION CONTROL FOR SHEET METAL COMPONENTS MANUFACTURING

+

PETER MATTHIESEN A/S	DK	* PRIME PROPOSER
WTCM/CRIF	B	*
BIBA	D	* Dir. N MARSTRAND
LOUIS POULSEN A/S	DK	* TRANSFORMERVEJ 14
CIM MANUFACTURING ENG.	B	* DK -2730 HERLEV
ETAP	B	*
ACTIF INDUSTRIES SA	B	* TELEP : 02/013255
SUAG	D	* TELEX :
BICC VERO ELECTRONICS GMBH	D	* FAX :
		*

P-2435-5-87 TITLE : DEVELOPMENT OF AN UNSTRUCTURED GRID BASED COMPUTER SOFTWARE SYSTEM FOR 2D AND 3D AERODYNAMIC DESIGN

COMPUTATIONAL DYNAMICS RESEARCH	UK	* PRIME PROPOSER
CONSTRUCCIONES AERONAUTICAS SA	SP	*
CIMEN	SP	* Dr. K MORGAN
		* INNOVATION CENTRE,UNIV SWANSEA
		* UK -SA2 8PSWANSEA
		*
		* TELEP : 792/295515
		* TELEX : 48358
		* FAX : 792/295532
		*

P-2437-5-87 TITLE : IMPROVED PRODUCTION OF THIN WALLED DUCTILE IRON CASTINGS; COMPUTER SIMULATION OF SOLIDIFICATION AND MOULDFILLING

IJZER EN METAALGIETERIJ DE GLOBE	NL	*	PRIME PROPOSER
LOVINK TERBORG BV	NL	*	
NEDERLANDSE IJZERGIETERIJ VULCANUS BV	NL	*	Ing.PC VAN ELDIJK
GIETERIJ DOESBURG BV	NL	*	WITVELDWEG 40
TU DELFT TECHNOLOGY AEROSPACE	NL	*	NL -5951 AK BELFELD
WTCM/CRIF	B	*	
PICANOL NV	B	*	TELEP : 077/769444
OMCO METALS NV	B	*	TELEX : 58055
DOVRE NV	B	*	FAX : 077/734848
ST ROCH COUVIN SA	B	*	

P-2019-6-87 TITLE : THE ROLE OF THE INTERFACE METAL-POLYESTER IN NEW TECHNOLOGIES LIKE 8MM VIDEO TAPES, FLOPPY DISCS, PRINTED CIRCUITS, CAPACITORS, PACKAGING FILMS.

DU PONT DE NEMOURS S.A (L)
BASF AG (D)
BRITISH VACUUM TECHNOLOGY (UK)
UNIV NAMUR (B)
UNIV CATH DE LOUVAIN (B)
CNRS (F)
UNIV KAISERSLAUTERN (D)
UNIV BORDEAUX (F)

PRIME PROPOSER

Mr. LUTGEN

L -2984 LUXEMBOURG

TELEP : 4790.635
TELEX : 2555
FAX : 359460

P-2024-6-87 TITLE : "PREPARATION OF REACTIVE PREMULLITE, MULLITE AND SIALON POWDERS".

UNION EXPLOSIVOS RIO TINTO, S.A (SP)
DYNAMIT NOBEL (D)
CSIC ICV (SP)
RWTH AACHEN (D)

PRIME PROPOSER

Dir. CONDE
MARQUES DEL RISCAL 2 - 6
SP -28010 MADRID

TELEP : 4/19.26.47
TELEX :
FAX : 4312990

P-2064-6-87 TITLE : PLASMA POLYMERISATION IN EXTRUSION PLANTS

BATTENFELD EXTRUSION TECHNIK GMBH (D)
ASPA PLAST HELLAS S.A. (GR)
INST.FUER KUNSTOFFVERARBEITUNG (D)

PRIME PROPOSER

Dr. A. LIMPER
KOENIGSTR. 45
D -4970 BAD OEYNHAUSEN

TELEP : 5731/2420
TELEX : 9724703
FAX : 5731/3276

P-2119-6-87 TITLE : ERASABLE POLYMERIC MEDIA FOR ANALOG INFORMATION STORAGE AND RETRIEVAL.

+

AKZO INTERNATIONAL	NL	* PRIME PROPOSER
GEC	UK	*
LASER-SCAN	UK	* Dr. VLEGGAAR
UNIV HULL	UK	* VELPERWEG 76
UNIV LEEDS	UK	* NL -6824 BM ARNHEM
		*
		* TELEP : 85/662731
		* TELEX : 45438
		* FAX : 85/662669
		*

P-2168-6-87 TITLE : NEW FAMILY OF POLYMERS OBTAINED BY MEANS OF AN ORIGINAL TECHNIQUE FOR LIVING ANIONIC POLYMERIZATION OF ACRYLIC MONOMERS; DEVELOPMENT OF PRODUCTION AND APPLICATIONS.

NORSOLOR	F	* PRIME PROPOSER
UNIV LIEGE	B	*
ENS. SUP. PHYSIQUE ET CHIMIE DE PARIS	F	* Mr. ROBINET
NIEDERLUCKE	D	* TOUR GAN PLACE DE L'IRIS
		* F -92080 PARIS LA DEFENSE
		*
		* TELEP : 1/47.78.50.41
		* TELEX : 610.826
		* FAX :
		*

P-2199-6-87 TITLE : NEW REINFORCED THERMOPLASTIC MATERIALS

+

ENIRICERCHE SPA	I	* PRIME PROPOSER
BATTENFELD EXTRUSION TECHNICK GMBH	D	*
IKV	D	* Mr. A. ROGGERO
POLYDATA LTD	IRL	* VIA F. MARITANO 26
		* I -20097 SAN DONATO MILANESE
		*
		* TELEP : 2/520.91.31
		* TELEX : 310246
		* FAX : 2/520.44.22
		*

P-2217-6-87 TITLE : DEVELOPMENT OF AN "ARTIFICIAL VESSEL" MADE OF A SYNTHETIC POLYMER BY COLONIZATION WITH NATURAL INTIMA CELLS.

RWTH AACHEN	D	*	PRIME PROPOSER
DEUTSCHES WOLLFORSCHUNGSINSTITUT	D	*	
UNION EXPLOSIVOS RIO TINTO S.A	SP	*	Dr. A. RICHTER
CARL FREUDENBERG	D	*	PAUWELSSTRASSE
UNIV SANTIAGO	SP	*	D -5100 AACHEN
HOPITAL SAINT ANTOINE	F	*	
		*	TELEP : 241/80-89288
		*	TELEX : 17241300
		*	FAX : 241/80-80028
		*	

P-2219-6-87 TITLE : DEVELOPMENT OF CERAMIC AND CERAMIC COMPOSITE MATERIALS FOR STRUCTURAL APPLICATIONS AT HIGH TEMPERATURES WITH IMPROVED
+ CREEP RESISTANCE CHEMICAL STABILITY AND RELIABILITY.

SAINT-GOBAIN VETROBEX	F	*	PRIME PROPOSER
CERAMIQUES TECHNIQUES DESMARQUEST	F	*	
LOMBA	SP	*	Dir. C. SAINT-JOHN
CERATEN	SP	*	BP 928
CSIC ICV	SP	*	F -73009 CHAMBERY
INSA LYON	F	*	
BAM	D	*	TELEP : 79.75.56.68
		*	TELEX : 320945
		*	FAX : 79.75.56.00
		*	

P-2226-6-87 TITLE : PREPARATION AND USE OF POLYMERIC ALLOYS FOR ELECTRICAL ENGINEERING APPLICATIONS.

LABOR.DE MARCOUSSIS	F	*	PRIME PROPOSER
UNIV LIEGE	B	*	
WERNER & PFEIDERER	D	*	Mr. J. ADDA
		*	ROUTE DE NOZAY
		*	F -91460 MARCOUSSIS
		*	
		*	TELEP : 1/64.49.11.61
		*	TELEX : 692415
		*	FAX : 1/64.49.06.94
		*	

P-2228-6-87 TITLE : SETTING UP OF A COOPERATIVE RESEARCH PROGRAMME ON METAL-OXIDE MATERIALS SUPERCONDUCTING ABOVE 77 K FOR USE IN
+ ELECTRONIC DEVICES.

LABOR.DE MARCOUSSIS F

PRIME PROPOSER

Mr. J. ADDA
ROUTE DE NOZAY
F -91460 MARCOUSSIS

TELEP : 1/64.49.11.61
TELEX : 692415
FAX : 1/64.49.06.94

P-2237-6-87 TITLE : POWDER METALLURGY OF MULTIPHASE ALLOYS OF REFRACTORY METALS BY USING SINTERACTIVE COMPOSITE POWDERS.
+

DORNIER GMBH D
ROYAL ORDNANCE PLC UK

PRIME PROPOSER

Ing.S. HAERDTLE
POSTFACH 13 60
D -7990 FRIEDRICHSHAFEN

TELEP : 7545/8.4315
TELEX : 734209
FAX : 7545/8.4411

P-2278-6-87 TITLE : NEW RED PHOSPHORS FOR TELEVISION TUBES

THOMSON F
SAMIM SPA I
VIDEOCOLOR SA I
UNIV BORDEAUX I F

PRIME PROPOSER

Mr. M. GRACIET
CORBEVILLE BP 10
F -91401 ORSAY

TELEP : 1/60.19.74.37
TELEX : 204780
FAX : 1/60.19.73.10

P-2293-6-87 TITLE : DEVELOPMENT OF NEW BORIDE-BASED CERMETS AND CERAMICS.

INDUSTRIAS BONASTRE SA	SP	* PRIME PROPOSER
UGICARB MORGON	F	*
CEIT	SP	* Dir.M. ALBAJAR
		* C/BIGUES 15
		* SP -08140 CALDES DE MONTBUI
		*
		* TELEP : 3/865.05.50
		* TELEX : 54949
		* FAX : 3/865.21.12
		*

P-2343-6-87 TITLE : SOLID ELECTROLYTIC CAPACITORS WITH CONDUCTING POLYMERIC ELECTRODE SYSTEM.

ERA TECHNOLOGY LTD	UK	* PRIME PROPOSER
THOMSON	F	*
ENICHEM SINTESI	I	* Dr. V. SKARDA
THOMSON	F	* CLEEVE RD, LEATHERHEAD
		* UK -KT22 7SURREY
		*
		* TELEP : 372/37.41.51
		* TELEX : 264045
		* FAX : 372/37.44.96
		*

P-2344-6-87 TITLE : DEVELOPMENT OF IMPROVED MATERIALS FOR HIGH VOLTAGE MULTILAYER CERAMIC CAPACITORS.

ERA TECHNOLOGY LTD	UK	* PRIME PROPOSER
INST.GUIDO DONEGANI	I	*
UNILATOR TECHNICAL CERAMICS	UK	* Dr. G.J. HILL
		* CLEEVE ROAD, LEATHERHEAD
		* UK -KT22 7SURREY
		*
		* TELEP : 372/37.41.51
		* TELEX : 264045
		* FAX : 372/37.44.96
		*

P-2361-6-87 TITLE : INTELLIGENT COMPOSITES CONTAINING MEASURING FIBRE OPTIC NETWORKS FOR CONTINUOUS SELF-DIAGNOSIS.

+

BERTIN & CIE	F	*	PRIME PROPOSER
UNIV STRATHCLYDE	UK	*	
GKN TECHNOLOGY	UK	*	Mr. M. LEQUIME
CISE	I	*	Z.I. D'AIX EN PROVENCE BP 22
HARWELL LABORATORY	UK	*	F -13762 LES MILLES CEDEX
EDF	F	*	
AERITALIA	I	*	TELEP : 42.60.01.11
		*	TELEX : 420729
		*	FAX : 42.60.00.13
		*	

P-2369-6-87 TITLE : PREDICTIVE TECHNIQUES FOR THE ANALYSIS AND DESIGN OF FIBRE-REINFORCED COMPOSITE MATERIALS AND STRUCTURES CAPABLE OF WITHSTANDING IMPULSIVE LOADING.

PRINCIPIA MECHANICA LTD	UK	*	PRIME PROPOSER
SEASTAR/CLAUDIUS DORNIER	D	*	
BECETEM V.Z.W.	B	*	Dr. T. MAINI
AMTEC NV	B	*	50 VINEYARD PATH NEWTON HOUSE
TU ATHENS	GR	*	UK -SW14 8HORTLAKE LONDON
		*	
		*	TELEP : 1/878.7933
		*	TELEX : 994694
		*	FAX : 1/876.7951
		*	

P-2370-6-87 TITLE : FIBER REINFORCED COMPOSITE WITH MODIFIED CEMENTITIOUS MATRIX.

CENTRE RECHERCHES PONT A MOUSSON	F	*	PRIME PROPOSER
CERILH	F	*	
ARMINES	F	*	Ing.P. SOUKATCHOFF
SIGMA BETON	F	*	BP 28
FORTON	NL	*	F -54703 PONT A MOUSSON CEDEX
INTRON	NL	*	
CEMENT AND CONCRETE ASSOCIATION	UK	*	TELEP : 83.81.60.29
POLYFORM CONCRETE LTD	UK	*	TELEX : 961330
INEGI	PO	*	FAX : 83.82.89.62
		*	

P-2397-6-87 TITLE : COST EFFECTIVE FABRICATION OF HIGH PERFORMANCE STRUCTURAL 3D COMPONENTS MADE FROM REINFORCED THERMOPLASTIC MATERIALS USING AN AUTOMATIC ROBOTISED WINDING PROCESS.

PER UDSEN CO AIRCRAFT INDUSTRY LTD	DK	*	PRIME PROPOSER
DORNIER GMBH	D	*	
ICI	UK	*	Dr. R. PAETSCH
IKV	D	*	FABRIVEJ 1
		*	DK -8500 GRENAA
		*	
		*	TELEP : 6/32.19.88
		*	TELEX : 63481
		*	FAX : 6/32.14.48
		*	

P-2401-6-87 TITLE : SILICON CARBIDE, SILICON NITRIDE AND CARBON WHISKERS FOR THE MANUFACTURE OF COMPOSITES WITH CERAMIC, METALLIC AND ORGANIC MATERIALS.

PECHINEY	F	*	PRIME PROPOSER
UNIV PORTO	PO	*	
CNRS	F	*	Mr. J. COHEN
INST.FILTRATION ET TECHN.SEPARATIVES	F	*	23 RUE BALZAC
BETH GMBH	D	*	F -75008 PARIS
HAMBURGER INST.FUER TECHNO.FOERDERUNG	D	*	
IST. GUIDO DONEGANI	I	*	TELEP : 1/45.61.61.61
MAHLE GMBH	D	*	TELEX : 290503
		*	FAX : 1/45.61.50.00
		*	

P-2408-6-87 TITLE : SINTERING OF METAL COATED CERAMIC POWDERS FOR WEAR AND FATIGUE RESISTANT COMPONENTS.

+

ARMINES	F	*	PRIME PROPOSER
UNIV BRADFORD	UK	*	
STICHTING GEAVANCEERDE METAALKUNDE	NL	*	Dr. M. JEANDIN
MANGANESE BRONZE	UK	*	BP 87
METAFRAM	F	*	F -91003 EVRY CEDEX
LNETI	PO	*	
		*	TELEP : 1/60.76.30.35
		*	TELEX : 600700
		*	FAX : 1/69.87.89.28
		*	

P-2411-6-87 TITLE : LASER DRIVEN SYNTHESIS OF POWDERS FOR THE PRODUCTION OF ENGINEERING CERAMICS. CHARACTERIZATION AND PROCESSING OF
+ THE POWDERS AND THE MECHANICAL AND CORROSION TESTING OF SINTERED SHAPES.

DSM	NL	* PRIME PROPOSER
CEN/SCK	B	*
CBL-OPTRONICS	B	* Dr. R. VAN HARDEVELD
TU DELFT	NL	* PO BOX 18
		* NL -6160 NP GELEEN
		*
		* TELEP : 4494/66597
		* TELEX : 36138
		* FAX : 4494/63167
		*

P-2413-6-87 TITLE : LIGHT TECHNICAL MIRRORS MADE OF CARBON-FIBRE REINFORCED PLASTIC.

KRUPP FRIED. GMBH	D	* PRIME PROPOSER
PHILIPS	NL	*
UNIV PATRAS	GR	* Mr. H.F. WILMS
		* MUENCHENER STR. 100
		* D -4300 ESSEN 1
		*
		* TELEP : 201/188.42.68
		* TELEX : 0857385
		* FAX : 201/188.22.50
		*

P-2414-6-87 TITLE : ECOPAVE - THE DEVELOPMENT OF A MULTI-PURPOSE COMPOSITE PAVEMENT SYSTEM.

NATIONAL ROAD LABORATORY	DK	* PRIME PROPOSER
CEMENTATION RESEARCH LIMITED	UK	*
AALBORG PORTLAND	DK	* Mr. I. SCHACKE
TRANSPORT & ROAD RESEARCH LABORATORY	UK	* ELISAGARDSVEJ 5/PO BOX 2354
DANSK BETON TEKNIK	DK	* DK -4000 ROSKILDE
CEMENT AND CONCRETE ASSOCIATION	UK	*
		* TELEP : 2/35.75.88
		* TELEX : 43209
		* FAX : 2/36.78.64
		*

P-2027-7-87 TITLE : CROSS-FLOW MICROFILTRATION AS AN EMERGING TECHNIQUE FOR INDUSTRIAL SEPARATION : DEVELOPMENT OF NEW GENERATION OF HIGH FLUX MEMBRANES AND MODULES ALLOWING FOULING CONTROL WITH HIGH DEGREE OF MASS TRANSFERT.

RHONE POULENC	- F	* PRIME PROPOSER
ADVANCED PROTEIN PRODUCTS LTD	- UK	*
UNIV LOUGHBOROUGH	- UK	* Mr. CHEILLE
		* 85 AV. DES FRERES PERRET
		* F -69192 SAINT-FONS CEDEX
		*
		* TELEP : 72.73.67.85
		* TELEX : 305.445
		* FAX : 72.73.68.63
		*

P-2079-7-87 TITLE : SEPARATION OF AQUEOUS ORGANIC ACIDIC MIXTURES BY PERVAPORATION.

+

BP CHEMICALS LTD	UK	* PRIME PROPOSER
GFT MBH	D	*
INST.FUER VERFAHRUNGSTECHNIK	D	* Dr. PEARCE
UNIV TECHNOLOGY ENSCHEDE	NL	* SALTEND, HEDON, HULL.
UNIV KOELN	D	* UK -HU12 8NORTH HUMBERSIDE
		*
		* TELEP : 482/892106
		* TELEX : 527004
		* FAX : 482/892280
		*

P-2328-7-87 TITLE : NEW TECHNIQUES FOR THE SEPARATION OF LIQUIDS AND GASES USING IMPROVED INORGANIC MEMBRANES.

+

HARWELL LABORATORY	UK	* PRIME PROPOSER
ENICHEM SPA	I	*
ENIRICERCHE SPA	I	* Dr. R.H. BELL
PERMUTIT CO LTD	UK	* BUILDING 429
MORGAN MATROC LTD	UK	* UK -OX11 0DIDCOT, OXON
ECN	NL	*
		* TELEP : 235/24141
		* TELEX : 83135
		* FAX : 235/43.23.40
		*

P-2026-8-87 TITLE : HETEROGENEOUSLY AND HOMOGENEOUSLY CATALYSED ELECTROCHEMICAL GAS PURIFICATION FOR SO2 AND NO REMOVAL.

DECHEMA	- D	* PRIME PROPOSER
DEUTSCHE CARBON A.G.	- D	*
ENSIC NANCY	- F	* Prof KREYSA
SOCREMATIC	- F	* THEODOR-HEUSS-ALLEE 25
		* D -6000 FRANKFURT AM MAIN 97
		*
		* TELEP : 49/7564328
		* TELEX : 412490
		* FAX :
		*

P-2130-8-87 TITLE : NEW ZEOLITE-BASED SHAPE-SELECTIVE CATALYSIS FOR THE PRODUCTION OF SPECIALTY CHEMICALS FROM NATURAL FEEDSTOCKS
+ VIA CO-METATHESIS.

OLEOFINA-SYNFINA	B	* PRIME PROPOSER
K.U LEUVEN	B	*
SUEDCHEMIE AG	D	* Dr. HINNEKENS
CATALYST AND CHEMICALS EUROPE	B	* WETSTRAAT 15
		* B -1040 BRUSSELS
		*
		* TELEP : 2/233.91.11
		* TELEX : 21556
		* FAX :
		*

P-2145-8-87 TITLE : DESIGN, PROTOTYPE EQUIPMENT CONSTRUCTION AND PERFORMANCE TESTING OF A TRANSFERRED ARC PLASMA SYSTEM APPLIED TO THE
+ PRODUCTION OF FINE CERAMIC PARTICLES.

TEIRONICS R & D LTD	UK	* PRIME PROPOSER
UNIV LIMOGES	F	*
G H INDUSTRIAL SA	SP	* Dir. PAGE
BILLITON RESEARCH BV	NL	* 5B LECHLADE ROAD, FARINGDON
		* UK - OXFORDSHIRE SH7 9AJ
		*
		* TELEP : 367/20224
		* TELEX : 444533
		* FAX : 367/21445
		*

P-2132-9-87 TITLE : MANUFACTURING TECHNOLOGIES FOR LEATHERS ADAPTED TO THE NEW ADHESION ASSEMBLY AND DIRECT INJECTION PROCESSES FOR THE
+ SHOE INDUSTRY

CENTRE TECHN CUIR,CHAUSSURE,MAROQUINER	F	* PRIME PROPOSER
INESCOP	SP	*
		* Mr. B. VULLIERMET
		* 9 AV JULES CARTERET
		* F -69007 LYON
		*
		* TELEP : 78/695012
		* TELEX : 340497
		* FAX :
		*

P-2143-9-87 TITLE : RESEARCH, DEVELOPMENT, CONSTRUCTION AND OPERATING OF A PROTOTYPE, AUTOMATED, MODULAR PRODUCTION SYSTEM FOR THE
+ FLEXIBLE, RELIABLE AND ECONOMIC PARTIAL ASSEMBLY OF A VARIETY OF GARMENTS

COURTAULDS CLOTHING LTD	UK	* PRIME PROPOSER
PFAFF INDUSTRIEMASCHINEN GMBH	D	*
GEC	UK	* Mr. M D DRURY
COURTAULDS RESEARCH	UK	* PO 114 HAYDN ROAD
		* UK -NG5 1GNOTTINGHAM
		*
		* TELEP : 602/609131/340
		* TELEX : 37555
		* FAX : 602/608131/247
		*

P-2165-9-87 TITLE : UNMANNED KNITTING PLANTS DEVELOPING A PROTOTYPE AND PRESCRIBING OPERATIONAL REQUIREMENTS
+

IIRS	IRL	* PRIME PROPOSER
CENTEXBEL	B	*
TNO	NL	* Dir. A. McNAMARA
PROTTI SPA	I	* BALLYMUN ROAD
TYNA KNITWEAR LTD	IRL	* IRL-9 DUBLIN
WEST END KNITWEAR	IRL	*
BLARNEY CASTLE KNITWEAR	IRL	* TELEP : 01/370101
APPAREL INDUSTRIES FEDERATION	IRL	* TELEX : 25449
WOLSPINNERIJ DER LEIE NV	B	* FAX : 379620
DELCOUR-VAN HOUTTE	B	*

P-2195-9-87 TITLE : SYSTEM FOR AUTOMATED FAULT DETECTION AND DIGITIZATION OF FLEXIBLE AND/OR LAMINAR MATERIALS

INVESTRONICA SA	SP	* PRIME PROPOSER
IDUNA NV	NL	*
GUCCIO GUCCI SPA	I	* Mr. V. CALZADO
		* TOMAS BRETON 62
		* SP -28045 MADRID
		*
		* TELEP : 1/4678210
		* TELEX : 23399
		* FAX : 1/4678723
		*

P-2197-9-87 TITLE : FLEXIBLE SEWING CELL

+

INVESTRONICA SA	SP	* PRIME PROPOSER
SANREMO MODA UOMO SPA	I	*
TNO	NL	* Mrs.R. BECERRA / B. ALCANTARA
INDUYCO SA	SP	* TOMAS BRETON 62
		* SP -28045 MADRID
		*
		* TELEP : 1/4678210
		* TELEX : 23399
		* FAX : 1/4678723
		*

P-2208-9-87 TITLE : AUTOMATION AND INTEGRATION OF CUTTING AND STITCHING WORKSHOPS IN A FLEXIBLE SHOE MANUFACTURING SYSTEM

+

SEPIC	F	* PRIME PROPOSER
ETS IMBERT	F	*
LABELLE CHAUSSURES	F	* Dir.T. HAITRE
INSAFAP	PO	* 2 AVENUE HOCHE
EMIN SA	SP	* F -75008 PARIS
SUTEAU SA	F	*
		* TELEP : 47/665154
		* TELEX : 649353
		* FAX : 46/227152
		*

P-2213-9-87 TITLE : AUTOMATIC ON-LINE SYSTEM FOR DETECTION, EVALUATION AND MAPPING OF DEFECTS AND SHADE VARIATION MONITORING ON FINISHED FABRICS

LEGLERTEX SPA	I	*	PRIME PROPOSER
MAHLO GMBH	D	*	
SCRIBA SRL	I	*	Mr. E. MANDELLI
INST.DI ELABORAZIONE DELLA INFORMAZ.	I	*	VIA SAN CLEMENTE 53
MARKS & SPENCER PLC	UK	*	I -24036 PONTE S.PIETRO
INDUYCO	SP	*	
BENETTON	I	*	TELEP : 035/609324
		*	TELEX : 300419
		*	FAX : 035/609405
		*	

P-2242-9-87 TITLE : FLEXIBLE ASSEMBLY CELLS FOR AUTOMATIC PROCESSING OF COMPLETE SUBASSEMBLIES OF CLOTHING PRODUCTS
+

KOCHS ADLER AG	D	*	PRIME PROPOSER
LAPP TRADING A/S	DK	*	
BRANDTEX A/S	DK	*	Ing.H. SCHOLL
		*	POTSDAMER STRASSE 190
		*	D -4800 BIELEFELD
		*	
		*	TELEP : 0521/2097570
		*	TELEX : 932759
		*	FAX : 0521/2097300
		*	

P-2269-9-87 TITLE : AUTOMATIC MANIPULATION FOR QUILTING AND DISTORTION CORRECTION OF PATTERNED MATERIAL, USING COMPUTER VISION AND DISTRIBUTED FEEDER SYSTEMS

COMERCIAL AUTEX SA	SP	*	PRIME PROPOSER
INP DE TOULOUSE - GTTSI	F	*	
CREATI	F	*	Dir.M. FLORIACH
LAB. AUTOMATIQUE ET ANALYSE DES SYST.	F	*	AVENIDA DEL PERU 53
OMAS	GR	*	SP -08304 MATARO
CETIH	F	*	
		*	TELEP : 7940929
		*	TELEX : 94407
		*	FAX :
		*	

P-2387-9-87 TITLE : DETECTION SYSTEM AND FAULT MARKER, ESPECIALLY FOR TEXTILE
+ DEFECTS IN THE PATTERN, STRUCTURE, SHEEN AND COLOUR WITHOUT COMING INTO CONTACT WITH THE MATERIAL ITSELF. CLASSIFICATION AND DISPLAY IN A PROTOCOL

UCO SA	B	*	PRIME PROPOSER
LAUFFENMUHLE GMBH	D	*	
LUCKENHAUS GMBH	D	*	Dir. J. HANET
BRANDTEX A/S	DK	*	BELLEVUE 1
MAY SENSORING GMBH	D	*	B -9218 GENT
GRUPO NARCISO DE OLIVEIRA	PO	*	
INST.FUER ARBEITSOKOLOGISCHE FORSCHUNG	D	*	TELEP : 91/309050
		*	TELEX : 4111450
		*	FAX : 91/317358
		*	

P-2395-9-87 TITLE : ULTRASONIC WELDING OF TEXTILE AND NON-WOVEN MATERIALS

BATTELLE-FRANKFURT EV	D	*	PRIME PROPOSER
BATTELLE-GENEVA	CH	*	
ZSK-STICKMASCHINEN GESELLSCHAFT GMBH	D	*	Dr. H. SPENKE
SODOCA	F	*	AM ROMERHOF 35, PO BOX 900140
KUSTERS E. MASCHINENFABRIK GMBH	D	*	D -6000 FRANKFURT AM MAIN 90
EID	PO	*	
		*	TELEP : 69/79080
		*	TELEX : 411966
		*	FAX : 69/790880
		*	

P-2424-9-87 TITLE : STUDY OF A MODULAR DEVICE FOR THE AUTOMATIC RECOGNITION OF DEFECTS IN FLEXIBLE MATERIALS.

ITT	F	*	PRIME PROPOSER
EMPRESA TEXTIL DE BARCELOS	PO	*	
UNIV VALENCIENNES	F	*	Mr. G. ALLIBERT
IAL SPACE	B	*	35 RUE DES ABONDANCES, BP 79
ALLEN BRADLEY	UK	*	F -92105 BOULOGNE BILLANCOURT
		*	
		*	TELEP : 20/472360
		*	TELEX : 140103
		*	FAX :
		*	

P-2431-9-87 TITLE : FLEXIBLE UNIT FOR REMOVING TEXTILE WORKPIECES FROM THE PILE AND OVERLAYING THEM.

ARMINES	F	* PRIME PROPOSER
UNIV DURHAM	UK	*
VICKERS PLC	UK	* Dir.P. ESQUIROL
UNIV POLITECNICA CATALUNA	SP	* 60 BD ST MICHEL
CETIH	F	* F -75272 PARIS CEDEX 06
WEIL BESANCON	F	*
MANUFACTURE P. BOYE	F	* TELEP : 66/785000
INSA LYON	F	* TELEX : 490623
		* FAX : 66/785034
		*

P-2434-9-87 TITLE : LINKING OF SEVERAL SEWING STATIONS WITH STANDARDIZED MATERIAL FLOW DEVICES FOR THE PROCESSING OF LIMP KNITTED FABRICS, INCLUDING FABRIC GUIDE CONTROL

PFAFF INDUSTRIEMASCHINEN GMBH	D	* PRIME PROPOSER
ITF MAILLE	F	*
DEVANLAY SA	F	* Mr. H. RAUH
		* KONIGSTRASSE 154, BP 3020/3040
		* D - KAISERSLAUTERN
		*
		* TELEP : 0631/2003457
		* TELEX : 45753
		* FAX : 631/17202
		*

CSO: 3698/A017

EC COMMISSION WANTS BRAIN DRAIN TO END

Brussels EEC INFORMATION MEMO in English No P(87) 62, Sep 87 pp 1-2

[Article: "A Researchers' Europe: The Commission Calls For a Major Initiative To End the Brain Drain"]

[Text] At the end of 1987 some 3,000 research workers will be involved in intra-Community cooperation schemes thanks to a programme originally launched on an experimental basis in 1983 and then superseded by an action plan for 1985-1988 supported by a 60 million ECU budget. The programme, known as the "stimulation plan", has made it possible to lay the foundations of the vital European "research area".

Specifically, it involves ensuring mobility for European research workers, i.e. giving young research workers a chance to become involved in advanced research programmes in other Member States.

By way of example, one of the most spectacular achievements under this programme has been the establishment of a European prototype of the future photonic microcomputer by a multidisciplinary, multinational team under the aegis of the University of Edinburgh.

Given the challenges emanating from the USA in particular,--the Commission would point out that between 1982 and 1985 some 6,800 European research workers emigrated to the USA, that in 1985 9% of the scientific and technical staff employed in US industry was of Community origin and furthermore that the US Strategic Defence Initiative will mobilize thousands of research workers and engineers, including those of Community origin, without there being an equivalent programme in the Community--the Commission is asking the Twelve to agree to a major initiative for the period 1988-1992 as European scientists urgently need a climate in which intra-Community cooperation in new areas of science and technology is both possible and actively encouraged.

The Commission's plan, which is known as Science and which it hopes to see adopted by the Twelve during the first half of 1988, provides for financial support of 167 million ECU. This should make it possible to involve 7,000 to 8,000 (full-time) research workers in technical and scientific interchange and cooperation by 1992.

Politically, the Commission feels it is the credibility and stature of the

Community's research capability that is at stake: The hope in the long run is to create a Community-wide network of cooperation schemes involving 5% of all European research workers, although only 0.6% will be involved by the end of 1987. The objective of the Science plan is to involve 1.5 to 2% of research workers in such schemes.

The Commission is thus also meeting a real need: Nearly two-thirds of research workers involved in advanced projects have so far been unable to obtain Community support due to a lack of resources.

The following areas are regarded as particularly suitable to benefit from the plan because of their multidisciplinary nature:

- mathematics
- physics
- chemistry
- life sciences
- earth and ocean sciences
- scientific instrumentation
- engineering sciences: fluid and solid mechanics.

A series of practical measures is proposed:

1. bursaries, research grants and advanced training courses

The proposal in particular is to provide funding to enable research workers to make short stays in a Member State other than their own, funding to cover the costs of travel, subsistence, removal and even the salaries of research workers seconded to a research team in a Member State other than their own for between 6 months and 3 years and, lastly, funding for young scientists taken on in industry and receiving lengthy training (from 1 to 3 years) in a public laboratory in a Member State other than their own.

2. laboratory twinning, operations contracts

Laboratory twinning involves the provision of support to associated teams to cover the costs incurred in meetings of research workers, joint experiments, exchanges, the dissemination of findings and the taking on of young scientists to strengthen the teams. Operations contracts are a particular type of twinning in which teams from various Community countries undertake jointly to attain a specific objective within a given time, which means that the operations are mission-oriented.

3. specific measures to encourage mobility

In addition to the aforementioned measures, the Commission intends to continue its work to help overcome the difficulties involved in the mobility of research scientists (social security coverage, pensions, etc...).

CSO: 3698A037

EC COMMISSION OUTLINES INFORMATION TECHNOLOGY POLICY

Amsterdam COMPUTERWORLD in Dutch 6 Oct 87 p 17

[Article by Jan Schils: "EC Commission Outlines Data Processing Policy"; first paragraph is COMPUTERWORLD introduction]

[Text] Brussels--The European Commission in Brussels has compiled a draft text for the European Council of Ministers recommending a policy and a priority program to develop the information services market. The recommendation points out that the increase in computer-related activities has an effect on employment which cannot be ignored.

It is estimated that in the EEC about 100,000 people are currently working in the electronic information sector. If libraries, traditional publishing houses, telecommunications services, and electronic equipment manufacturers are included, millions of people work in this field, according to the EC Commission.

Steady Effort

The EC Commission wants future EC internal policy to focus on the following priorities: creating an internal market for computer services, stimulating and increasing the competitive production capacity of European manufacturers, promoting the use of new advanced information services in the EEC, and increasing internal and external cohesion of the EC in the field of information services.

In its priority action program the EC Commission suggests two complementary methods: first, a steady effort to improve market conditions and stimulate the use of modern information services, and second, a number of pilot and demonstration projects which can act as catalysts to develop markets in vital sectors.

To implement these two methods the Commission suggests the following concrete steps: establishment of a European center to observe the information market, programs for standardization, cancellation of legal and administrative obstacles, improvement of transmission facilities and access to information services, measures to improve cooperation between the public and the private sector, initiation of pilot projects, programs for libraries, and programs to facilitate access to existing information services.

Emphasizing standardization, the EC Commission is announcing measures to standardize access procedures to databases, thereby reinforcing progress being made in the area of standards for telecommunications and new data processing technologies.

Efforts

In addition to the measures already taken by the EC Commission in close consultation with the Senior Officials Groups for Telecommunications (SOGT) and for Information Technologies Standardization (SOGITS), the following initiatives will be launched: harmonization of the codes and names of common fields in databases of the same type in order to facilitate their use by occasional users, cross searching strategies, and remote downloading.

Another initiative deals with adjusting the indexing and classification rules of electronic information services and products.

The efforts to standardize access to databases will also be supported by work being done in the framework of other EEC programs such as DELTA [Developing European Learning through Technological Advance] and AIM [Advanced Informatics and Medicine].

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CSO: 3698A041

SIEMENS DIRECTOR ON EUROPEAN R&D STRATEGY

Paris POLITIQUE INDUSTRIELLE in French Summer 1987 pp 9-19

[Article by Karlheinz Kaske: "World Challenge, European Response"; the author, 59, who has an engineering doctorate in physics, is president of the board of directors of Siemens AG, which he joined in 1950; first paragraph is POLITIQUE INDUSTRIELLE introduction]

[Text] If it can speed up the creation of a common market, stimulate cooperation between companies and support research and training, Europe can face Japan and the United States on an equal footing.

The European Community, whose ties are strengthening, maintains a highly interdependent relationship with the world economy. The EEC is currently number one in world commerce. Its exports to non-EEC countries total about $300 billion, mostly in industrial products. Finally, EEC companies intensively cooperate with numerous non-EEC companies on diverse technology topics.

Of necessity, companies like Siemens have adopted an open attitude toward the world market, including the American and Japanese markets, not only because of the size of both markets but also because, as in Europe, they are a source of important technological progress. Cooperation between companies therefore cannot be limited to Europe. By the same token, relations between the EEC on the one hand and the United States and Japan on the other cannot be based solely on competition; there must also be cooperation.

This attitude in no way questions the importance of the EEC. On the contrary, the fact that the United States and Japan are important industrial competitors of the EEC and that there is even a degree of dependency on the United States in certain areas, makes the development of Europe's economic unity especially urgent.

Technologically, Europe Is Not Behind the United States and Japan

I am not pessimistic about the performance of European companies. On the contrary, I feel that the summary judgments which describe a European sclerosis or technology gap are totally unfounded. An increasing number of

articles are being published in the United States today which describe European advances in certain areas. The reality is that companies on the cutting edge of technology or manufacturing are as much European as American or Japanese.

Furthermore, the competitiveness of American industry has declined in many sectors in the past few years. Thus, the U.S. electronics industry (with the exception of data processing) currently has a trade deficit of $20 billion, and the automobile industry is in the same situation.

For several American industrial sectors, this situation conceals long-term dangers. It should be specified, however, that over the years an overvalued dollar has played a role in this area. The decline of the dollar will thus reinforce, over time, the American trade balance, all the more so as American companies show a great deal of vitality and a broad capacity for innovation. All this will increase their competitiveness, which will affect American imports more quickly and strongly than exports.

Japanese Pressure on the European Market Will Grow

There is no doubt that Japanese competition will remain quite acute over the next few years. The range of Japanese exports will broaden. There are already certain indications in electrotechnology. Whereas at one time Japanese exports concentrated mainly on consumer electronics, they are now increasingly concentrated in the areas of electronic components, data processing, medical technology, and communication and information technologies.

But there is no reason to panic as even Japan is experiencing economic constraints. Japan's economic growth has wavered to an extent that the Japanese themselves consider dramatic. During the first half of 1986, the gross national product increased by only 2 percent. In the years to come, the structure of Japanese industry will have to change considerably. This is also true of Japanese exports, as much for geographical spread as for product range.

The Japanese will be forced to pay greater attention to the European market, especially since they have incurred major losses in the United States. The EEC must be watchful that commercial relations are not founded on dubious practices. In particular, it must pay close attention to the agreement between the United States and Japan limiting the importation of integrated circuits.

Furthermore, this agreement provides that the pricing of Japanese exports be straightforward. In addition, even if not stated explicitly, it defines an objective for American microchip exports to Japan (20 percent of the Japanese market). The EEC has filed a complaint with the GATT regarding this agreement.

In Global Competition, the Size of the Domestic Market Is Decisive

The war on unemployment will be the priority goal over the next 5 to 10 years

for the EEC countries. To be sure, all these countries are benefiting from a relatively favorable economic cycle. Growth of the gross national product should be between 2 and 3 percent in 1986 and 1987; industrial output is currently growing by 5 percent annually.

The problems of the future, however, are not a matter of economic cycles. They have more to do with the ability to master a profound structural change which will result, for example, in the development of services and in a change in the relative importance of the various industrial sectors. To limit as much as possible the friction resulting from this permanent evolution, sufficient growth must be guaranteed. It is therefore essential to innovate and to improve European competitiveness.

How can EEC policy contribute? As competition focuses on a worldwide market, the size of the domestic market becomes increasingly decisive for developed industrial countries. Countries with a large domestic market have a clear competitive advantage.

In fact, from the outset, they have the opportunity to manufacture and distribute their products on a large scale with the advantage of reduced costs due to mass production. The economic advantage of mass production is not limited to manufacturing; it is also a factor in research and development [R&D] and software costs.

Take, for example, the electronics industry. In 1985, the United States held a good third of the world electrotechnology market (volume: more than DM2,200 billion) while Japan's share was one-fifth. The entire EEC electrotechnology market roughly corresponds to the size of the Japanese market.

The Problem of the European Market Is Not Size, But Lack of Unity

But this comparison is somewhat utopian in that it presupposes that the European market is as homogeneous as the other two. This is not the case because the behavior of buyers, for example, is still subject to national criteria, notably due to the influence exercised by the various states.

The efforts undertaken by the European Commission to achieve a common market are thus measures in the right direction. More particularly in the field of future technologies, it is essential that a true European common market be created if the Europeans do not want to become second rank players in the international league. In fact, with a population of 320 million, such a market holds considerable potential.

Setting up a united European market is a gigantic task. The European Commission's White Book sets out hundreds of factors. These include border controls, the elimination of technical trade barriers, public procurement policy, the creation of a common services market, the general conditions of the money market, cooperation between companies, protection of patent rights, and elimination of tax barriers.

The EEC is far behind, even in executing the tasks--defined and consigned to the White Book by the EEC itself--leading to a common market. Many

decisions which should have been made in 1985 and 1986 were not made in due time. But despite this undoubtedly negative factor, there is no reason to limit ourselves to complaining about the lack of concrete progress.

Instead, these obvious difficulties should prod the Commission into deeper analysis to see whether defining stricter priorities would simplify the intricate list of measures in the White Book. If a minimum of regulation seems necessary, the solution certainly does not lie in accumulating national statutes by the member countries.

States Cannot Be Disinterested in High Technology

Europe's economic unity cannot be limited to opening up domestic markets. The adopted technology policy will play an even more important role. But is it really necessary that the EEC member countries, that the Community as a whole, have a well-defined technology policy?

First, it should be noted that R&D, like manufacturing and marketing, is one of a company's regular tasks. As a general rule, the companies themselves should provide the necessary resources.

Second, besides competition between companies, there is competition between states. Thus, the United States and Japan have had an active technology policy which has led, for example, to the U.S. Government financing about one-third of the R&D expenses of U.S. economy. In the FRG, the proportion is one-sixth.

At Siemens, government participation in overall R&D expenses is 2.5 percent, excluding the nuclear sector. It thus seems wrong to me to adopt, for mere reasons of economic purity, an attitude which largely advocates disengaging the state from the domain of technology. On the contrary, the government should, in a limited number of key economic sectors, support corporate R&D activities and assume part of the risk when investment in personnel and equipment exceeds the risk which a company can reasonably withstand.

The Mega project is a good example. There are only about a dozen companies in the world capable of initiating research on the next generation of highly integrated circuits. There are only two among the European companies: Philips and Siemens.

These studies do not involve only memory technologies, but also mastering incredibly minute, submicron-level structures which will have an enormous impact on equipment and systems technology in large sectors of the economy. This is why the cooperation of Philips and Siemens in the Mega project largely surpasses the corporate level to achieve a European dimension.

Most Dynamic American Companies Benefit from Federal Programs

Compared to the EEC, the United States and Japan have the advantage of a single decisionmaking structure in both economic and technological matters. This is quite evident in the large weapons and space programs implemented by the United States. Thus American industry is especially competitive in those

sectors which have benefited the most from these large programs, such as electrotechnology and, in particular, certain areas of electronics.

By reason of its political context, the EEC can only choose a third path, which should be characterized by systematic cooperation in technology.

Research programs such as ESPRIT are appropriate vehicles. They create favorable conditions for R&D cooperation between European companies and lead to synergy due to the combined efforts of companies from different EEC countries.

Siemens thus participates in projects in the five areas of ESPRIT's first phase. They deal with advanced microelectronics, software, information handling, office automation, and computer integrated manufacturing, with the main accent on microelectronics. In this area, Siemens is involved in international cooperation (an essential condition for EEC funding) with such companies as ICL, Philips, Thomson, and Plessey.

Moreover, the EEC is currently preparing another very interesting research project. This is the RACE project (Research and Development in Advanced Communication Technologies for Europe). The program focuses on telecommunications, an area in which Europe intends to play a leading role in the development of integrated services digital networks [ISDN]. In fact, these networks are a cornerstone of the future communications and information system for the economy. Within the framework of RACE, standardization plays a key role because it is a fundamental condition for creating a single telecommunications market in Europe.

Basic technologies, too, must be approached collectively within the framework of ESPRIT (because remote data processing involves all technologies) to avoid the risks of fragmenting or duplicating costly work. Pilot projects will be conducted within a cooperative framework with the postal authorities, which are better equipped for this sort of activity.

The scope of Siemens' R&D projects for ESPRIT and other EEC programs is limited in relation to the company's investments in its own R&D programs in the area of information technologies. This corresponds with the company's philosophy, which holds that government aid for research can be no more than a complement to a company's own activities.

All cooperative R&D projects--including most definitely EUREKA--that are undertaken with the main aim of obtaining subsidies are therefore excluded. This is why Siemens collaborates on projects which are absolutely indispensable both technologically and economically, if only because of the dearth of qualified collaborators.

It is also necessary that subsidies do not distort competition by, for example, sustaining projects for which European companies have already developed solutions. The risks of unfair competition will be lessened if cooperation is limited to areas where there is not yet competition.

At Present, the EUREKA Project Can Distort Corporate Competition

The EUREKA project can provide additional incentives. However, there are still unresolved problems concerning competitive policy. Thus, companies which have developed technology ready for application within the cooperative framework of EUREKA might find they are prevented, by reason of current competitive policy, from mutually benefiting from their achievement.

For example, if three companies cooperating within EUREKA wish to market the result of their research through a joint company, they could be hampered by the extremely burdensome procedures of the European Commission, or by the antitrust measures adopted at the national level. Meanwhile, companies from other countries will have marketed the technology.

Obviously, such problems also arise in the setting of a purely national competition policy. However, additional obstacles to company cooperation exist at the EEC level resulting from, for example, the lack of a European statute for companies, or even tax barriers. A dialogue concerning all these obstacles has begun between the European Commission and industry.

Post-Industrial Europe Is Not for Tomorrow

Energy policy is one of the major themes of the economic policy of the EEC member countries. This subject concerns us especially since the discussion about nuclear energy in the FRG has been particularly emotional and at times even irrational.

It seems, however, that in the meantime more objective positions have been taken. In fact, a recent opinion poll shows that the majority of the population does not want to forego nuclear energy in the times to come. Even if the worries and anguish about nuclear energy are legitimate, they cannot in any case serve as an alibi for wrong decisions whose grave consequences could only be corrected later with great difficulties.

Europe will remain an industrial region for a long time. Post-industrial society, in the proper sense of the term, is not yet in sight.

For European industry to be competitive on an international level, it must have access to reliable and cheap energy. Because natural resources mean that this is not a given, we must show constant initiative in defining a farsighted and adaptable energy policy.

I think, therefore, that decisions relating to energy policy should not be made without consultation within the EEC framework. It goes without saying that one cannot expect to develop competitiveness and growth, improve employment, and increase the standard of living, if at the same time the essential technological and economic bases are called into question using unwise ecological arguments.

No European Monetary System Without Conforming the Convergence of Political Economies

The existence of a common market and the adoption of a forward-looking policy by the EEC institutions are insufficient to ensure the international competitiveness of European companies, and thus the further progression of our economic and social systems. As an industrial leader, I would like to define the following needs, which are applicable to the economic policy of the EEC member countries and to the EEC as a whole.

- Companies need a sufficient margin to resolve their tasks in a creative and optimal fashion. Strict limits must be put on the planned economy. The functioning of a united internal market should not be hampered by contradictory national policies. It is therefore essential to strive for agreement among national economic policies in the sense of opening up the market. Without this convergence, I do not think there is a real possibility of creating a European monetary system.

- Companies should have the financial conditions necessary to withstand the high risks of the current period, characterized by especially short innovation cycles. For this, companies must put together a sufficient amount of venture capital. This implies in particular a suitable fiscal policy. Only in this way will companies be able to achieve large-scale innovation, without which an economy cannot prosper.

- It is advisable to create conditions favorable to the start-up of new companies. Siemens has taken the initiative in this area by joining two venture capital funds. We also encourage young collaborators who want to work on their own. In general, it seems it has become much easier to start new companies in Europe.

No Economic Performance Without Training

Conditions of greater mobility and flexibility must also be created for the labor market, especially an expanded system of flexitime.

- In R&D, collaboration between the state and industry must become more intense and constructive. This requires broad cooperation between companies, universities, and scientific research institutes. In the FRG, reservations in this area have fortunately diminished considerably. There should not be any contradictions between the universities and the economy.

- Efforts to provide training and refresher courses at all levels, from companies to universities, should be intensified. Specifically, this concerns all areas of training essential to the success of the high technology sectors. It involves, for example, an introduction to computers and software in the early school years.

- The Common Market should be open to the outside to avoid exclusion from the world market. This means giving vigorous support to the liberalizing efforts undertaken in the context of the new GATT negotiations. This is indispensable

in establishing the best possible relations between the three great trading partners of the world, namely the EEC, the United States, and Japan.

Helping Debtor Countries Consolidate Their Economies

To achieve a stable equilibrium within the world economy, developing countries must be given sufficient opportunity to evolve. We must solve the serious problems resulting from overindebtedness, particularly in Latin America. This is in the interest of industry, which will otherwise lose substantial future markets. The heavily indebted countries must be allowed to consolidate their economies in a growth context. The new agreements dealing with the settlement of Mexico's external debt, with provisions for long-term reimbursement, provide a true model.

In summary, it is clear that in the time to come, the EEC will be confronted with important challenges imposed by the world economic situation. European evolution over the last 3 or 4 years has shown, however, that it is still possible to mobilize a vast potential of managerial skills and technological innovation, strengthened by a real entrepreneurial spirit, on the Old Continent. We are witnessing a true renewal of the European economy, and the results are already convincing. The decline of the West will therefore not take place.

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PROGRESS AT EUREKA MADRID MEETING IN ATTRACTING PRIVATE FUNDS

36980057 Rijswijk PT AKTUEEL in Dutch 23 Sep 87 p 7

[Article by Bart Stam: "Eureka Financing Problems Appear Eliminated After Conference in Madrid"]

[Excerpts] In contrast with Sweden where the fourth ministers conference was held last year December, Spain was a very enthousiastic Eureka host. The fact that the organization under the leadership of Minister Luis Carlos Croissier (Ministry of Industry and Energy) often looked more like some sort of amateur ball, did not matter. In any case, the fifth ministers conference in Madrid will go down in history as the meeting where one of Eureka's main obstacles -- funding for projects by means of private capital -- was tackled with great energy. European bankers, companies and investors seem to have largely abandoned their objections to supporting as yet non-existent products. Meanwhile the 19 delegations agreed to 58 new projects with a total value of 700 million Ecu, about 1650 million guilders.

Generally, the Spanish reactions to the conference were extremely positive from the side of the government as well as the press.

Financing

During the conference in Stockholm the German delegation came forward with the plan to create a special Financial Round Table for Eureka in order to make it possible to fund Eureka projects by private means. The delegation of the Federal Republic referred to the Hannover declaration that after the feasibility phase the projects are to be funded mainly by money from the private sector and that the role of the national governments is to be limited as much as possible.

Messages of support

The German proposal did not make it but it did work as some sort of a catalyst, i.e. several financiers who had apparently been roused in the past few months, were present in Madrid: the EBRT [European Bankers Round Table], Abecor [Associated Banks of Europe] and also EIB [European Investment Bank], all of which made sympathetic statements with regard

to project financing. For instance, EBRT, a society of representatives from the large financial institutions, thinks that European private capital can play an important role in the development of innovative products and thus contributes to cooperation among European countries. "Apart from the debate on stimulating European technology programs we should also work on a strategy to set up more private ways of financing for Eureka. Further, the national member states should synchronize their potentials with regard to private and risk-bearing capital in a better manner. Also, advice and suggestions should regularly be given to the national governments and the European Committee."

The EBTR thinks that the financial institutions should tender for Eureka projects more often than before. The cooperation between all parties concerned -- architects, engineers, computer specialists, market researchers, and financial experts -- could be better. The EBTR proposes to set up "interdisciplinary" teams which need to work out Eureka's new financing structure.

The EVCA (European Venture Capital Association] says it wants to support young, innovative companies in Europe. The EVCA points to the more than 100 investment organizations, united in EVCA. "These investors are increasingly cooperating in transnational organizations. EVCA meanwhile stipulated that Eureka's financial picture of the projects and proposals will reach all associated members as soon as possible by way of the database and the electronic mailbox. Further, consultations will regularly take place between Eureka's international secretariat in Brussels and EVCA's board of directors which notes that the project should particularly benefit the medium size and small businesses. According to EVCA the MKB [medium size and small businesses] is the engine of the economy, innovations and employment in Europe.

Satisfaction

Altogther the Dutch delegation in Madrid was satisfied about the progress of Eureka and the quality and quantity of projects with Dutch input. Because Minister R.W. de Korte had to be present for the opening of the parliamentary year, top official R.F. de Bruine, general technology policy director at the Ministry of Economic Affairs, was allowed to join the other European ministers whose portfolios include technology policy. De Bruine noted that government financing in Eureka should be reduced as much as possible; innovative projects only have a chance to succeed if companies take the initiative. De Bruine welcomed the statements of the European money-lenders as a first, important step towards financing Eureka with risk-bearing and private capital. The top official of EZ (Ministry of Economic Affairs] expresses the hope that the financing plans will be worked out further during the sixth ministers conference in Copenhagen in June of 1988. According to De Bruine governments should unyieldingly continue to remove fiscal and bureaucratic barriers which are, together with private financing, the most complicated problems. He thinks that Eureka's formula should be maintained without exception:

industry determines the technological developments, governments adjust their policies. The, in his eyes "good", symbiosis between government and industry in the HDTV [High Definition Television] project proves that this is possible. "Governments and industry work hand in hand here to develop unequivocal technical standards and thus to create a large home market."

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FRENCH LAW ENCOURAGES CREATIVITY, INVENTION

Paris MUTATIONS in English No 2, 1987 pp 6-8

[Article: "The Brain Pool--Evaluation of Intangible Investments"]

[Text] Ability, energy, initiative and human creativity are becoming the essential and almost unique model of modern economy. Gone is the time when equipment investments solely prevailed and when labor planning resulted in the retribution of wages for manual rather than mental endeavours.

The brain revolution which we experience daily brings new changes to the previous state of things.

Business competition, creation, development or diversification, employment problems, are now linked to massive investments aimed at increasing intellectual resources.

One knows to evaluate the actual or bookkeeping value of a given building, plot of land or machine. Intellectual resources having become essential must be evaluated but are more difficult to assess.

Anyone assuming some responsibility in our society is aware that the worth of a business, a firm, a practice, depends primarily on the clientele and the quality of the management, associates, employees; on its dynamism, its image and profitability...

Audit firms, bankers, insurers, auditors, even the treasury cannot limit themselves to the examination of material investments listed on balance sheets and must investigate:

- the efforts devoted to the formation and quality of internal organization, the corporation internal management program, the speed and spontaneity with which it may react, the modernity of data processing, robotics or quality control facilities;
- research and valorization spending as well as the actual value of patents, licences, know-how and industrial proficiency;
- the quality of the commercial network and of its integration in decision making processes;
- the nature and reputation of the firm or its products.

The Brain Pool

Interview by Mrs. Roselyne Koskas, chargee de mission, Technopole Services, Sophia Antipolis, of Mr. Pierre Laffitte, senator from Alpes Maritimes, founder-chairman of Sophia Antipolis.

Roselyne Koskas: You have just submitted to the Senate a legislative proposal aimed at creating a new type of corporation: evolutionary partnership corporation. What is its significance?

Pierre Laffitte: This proposal concerns corporations where consultations between partners wishing to create and develop corporation planning is free and permanent. This may seem natural? Well, it is not obvious.

When a corporation is created, French trading laws acknowledge capital, financial and material contributions. But the law has a tendency to shy away when these contributions are in a less tangible form such as research, patents, educational programs and even publicity or business training. To be sure, the mediation of assets auditors is legally provided for but is often difficult.

R.K.: In what respect does your legislative proposal modify this situation?

P.L.: I will, on purpose, bring up a simple and imaginary instance: Let us imagine a person to person partnership between an inventor and a financier. Let us imagine further that the inventor evaluates his invention and the contribution of his personal competence and industrial connection network at 5 million francs. He will provide patents, ideas, energy, his industrial contribution and a token franc. He wishes to remain a majority shareholder.

At the start the corporation needs one million cash and if all proceeds according to plans, 2 million after 2 years and 2 million after 4 years.

After a thorough investigation the financier is satisfied with the quality of the product and the potential market. But, as a guarantee, he negotiates an agreement with the inventor according to which the latter commits himself in terms of turnover and market breakthrough within the framework of a growth plan to be met.

If these objectives are met, the corporation shares will be 50/50. If partly met, the inventor industrial contribution shall be valorized to a lesser degree and perhaps represent 25% of the assets.

The whole deal is freely negotiated between partners who evaluate their share as a function of the results achieved. This is what is meant by evolutionary partnership.

R.K.: Does it not grant the inventor an unfair advantage?

P.L.: Not at all. The financier may also set up the barriers necessary for his protection if the expected growth is not achieved.

Besides, the unambiguous purpose of this legislative proposal is the recognition by French trade laws, the business world, the assets auditors corporation, even the State, of the amazing growth of intangible investments.

For what is the meaning of the commitments made by the fictitious inventor referred to above, such as contributing his competence, his energy, his invention, other than typical brain investment. Today, this type of investment is paramount in concerns. From now on, it is imperative that competency and financial assets be free to negotiate as they see fit.

R.K.: Why?

P.L.: Simply to be in accordance with the times we live in and come out of the 19th century. Time is no more when machines represented the bulk of a concern assets and investments.

Gone also is the time when labour planning resulted in the remuneration of wages to employees solely for manual endeavours.

We are going through a brain revolution where human initiative and creativity represent practically the sole driving force of our economy.

The overall worth of a corporation, business or practice first depends, as anyone knows, on the clientele and on the quality of management, associates, employees and labor force, on its dynamism and brand image.

This is what constitutes its future profitability, hence its worth, not what figures on its balance sheet as equipment or buildings.

R.K.: How do you define intangible investments?

P.L.: Difficult question. Experts are fighting over this connotation but the upshot of it simply is that intangible investment is what constitutes the competence-assets of a corporation. It is customary to include the following four key activities: research, marketing and advertising, training, computerization. The corresponding expenses are actually easy enough to obtain and single out. It would seem logical to add to this two elements such as corporation image with respect to the outside (sponsoring, patronage, external relations...) and corporation management programs; in other words, the result of internal organization endeavours.

R.K.: Coming back to your legislative proposal, how will its debate and eventually its passing bring about a change in attitudes?

P.L.: This legislative proposal is only an element of a bigger problem but it represents, in my view, an important link in an unavoidable evolution. In many respects our trade laws prevent business representatives to innovate. It is a constraint stemming out of Roman law and from which Anglo-Saxon countries are gladly free.

To give freedom to those contributing competence assets and to those

contributing financial assets to negotiate more freely in a purely contractual framework is a step towards modernity.

My wish is that, step by step, our judicial, administrative and fiscal systems make France one of the most attractive countries for those striving to innovate and create.

This implies that bankers, insurers, audit firms, income tax experts, officials, jurists and politicians at last give their attention to the new economic reality of a world where only creativity and invention may provide control of the future.

CSO: 3698A060

BRIEFS

NETHERLANDS STEPPING UP EUREKA R&D FUNDING--State aid to research and development now holds an important share of the total resources devoted by Member States to industrial development and the Commission has been examining a growing number of notifications since the publication of its Framework on aid to R&D in April 1986. The two most recent cases to receive Commission approval are two Dutch schemes designed to promote basic industrial research. The Programmatische Bedrijfsgerichte Technologiestimulering 1987 [Programmatic Company-Oriented Technology Incentives 1987] contains a number of subprogrammes--new production methods, information services, biotechnology material and medical technology. Aid will be available from a budget of 34.4 million ECU (80.6 million guilders) to finance feasibility studies, research projects and demonstration projects. The Bedrijfsgerichte Technologiestimulering van Internationale Projecten 1987 [Company-Oriented Technology Incentives for International Projects 1987] has a budget of 12 million ECU (26 million guilders) and provides aid for feasibility and research projects in the context of EUREKA and certain bilateral cooperative research projects with Israel. In line with previous Commission decisions on aid for participation in EUREKA projects, the Dutch Government is required to notify in advance aid towards the cost of participating in EUREKA projects costing more than 20 million ECU. The Commission considers both schemes to be compatible with its R&D Framework. In its decision it has asked the Dutch Government to submit reports on the operation of the schemes. [Text] [Brussels EEC PRESS RELEASE in English No IP(87) 467, 4 Nov 87 p 1]

EUREKA SOLID LASER PROJECT--The mid-term aim of the European EUREKA project on power solid lasers is to produce multi-kilowatt lasers (up to 5 kW, currently the most powerful is 400 W), suitable for use in machine tools: the targetted end use being a laser machining robot. Four European countries have joined forces to achieve this aim: UK, FRG, Italy and France. The application of lasers in materials working was a two billion franc (400 million dollar) market in 1985 with an annual rate of expansion of 20%. Within this field, the solid active-medium laser would appear particularly well suited providing numerous advantages: compactness, flexibility in use and machining precision. LETI (Electronics and Computer Technology Laboratory) and the CEA (Atomic Energy Commission) have been designated as the engineers for France on this project. The industrial firm Quantel is to coordinate research into materials undertaken by Crismatec, the University of Lyon, Baikowski and Sorem. [Text] [Paris FTS--FRENCH TECHNOLOGY SURVEY in English Jun 87 p 1]

BRIEFS

SPANISH-SOVIET JOINT VENTURE--The Spanish semiprivate Telefonica company has signed an agreement to create a joint venture in the USSR: Initially, this company will manufacture 500,000 Tharsis telephones per year and 1 million telephones after 3 years. [Text] [Paris L'USINE NOUVELLE in French 5 Nov 87 p 83] 25063

CSO: 3698A048 END